

## SEQUENCE LISTING



<110> Osteryoung, Katherine W.  
Vitha, Stanislav  
Koksharova, Olga A.  
Gao, Hongo

<120> Plastid Division and Related Genes and Proteins, and Methods of Use

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Pro Ala Val Leu Val Val Gly Gln Gln Thr Asp Gly Lys Ser Ala Leu		
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Val Glu Ala Leu Met Gly Phe Gln Phe Asn His Val Gly Gly Gly Thr			
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Lys Thr Arg Arg Pro Ile Thr Leu His Met Lys Tyr Asp Pro Gln Cys		
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Gln Phe Pro Leu Cys His Leu Gly Ser Asp Asp Asp Pro Ser Val Ser  
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Leu Pro Lys Ser Leu Ser Gln Ile Gln Ala Tyr Ile Glu Ala Glu Asn  
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Met Arg Leu Glu Gln Glu Pro Cys Ser Pro Phe Ser Ala Lys Glu Ile  
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Ile Val Lys Val Gln Tyr Lys Tyr Cys Pro Asn Leu Thr Ile Ile Asp  
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Thr Pro Gly Leu Ile Ala Pro Ala Pro Gly Leu Lys Asn Arg Ala Leu  
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Gln Val Gln Ala Arg Ala Val Glu Ala Leu Val Arg Ala Lys Met Gln  
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His Lys Glu Phe Ile Ile Leu Cys Leu Glu Asp Ser Ser Asp Trp Ser  
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Arg Thr Ile Val Val Ser Thr Lys Leu Asp Thr Lys Ile Pro Gln Phe  
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Glu Phe Lys Gln Ala Val Ser Leu Arg Glu Met Glu Asp Ile Ala Ser  
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Ile Gly Ile Ser Lys Leu Arg Leu Phe Leu Glu Glu Leu Leu Trp Lys  
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Arg Tyr Lys Glu Ser Val Pro Leu Ile Ile Pro Leu Leu Gly Lys Glu  
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Gly Thr Val Val Ala Pro Pro Asp Lys Phe Gly Glu Thr Leu Gln Asp  
370 375 380

Glu Arg Thr Gln Gly Gly Ala Phe Val Gly Thr Asp Gly Leu Gln Phe  
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Ser His Lys Leu Ile Pro Asn Ala Gly Met Arg Leu Tyr Gly Gly Ala  
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Gln Tyr His Arg Ala Met Ala Glu Phe Arg Phe Leu Val Gly Ala Ile  
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Lys Cys Pro Pro Ile Thr Arg Glu Glu Ile Val Asn Ala Cys Gly Val  
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Glu Asp Ile His Asp Gly Thr Asn Tyr Ser Arg Thr Ala Cys Val Ile  
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Gly Glu Ala Ser Thr His Ser Gln Glu Ile Ala Ser Asn Phe Cys Ile  
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Phe Val Glu Ser Thr Glu Lys Ser Cys Arg Asp Lys Cys Met Glu Asp  
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Arg Ala Gly Leu Arg Gln Phe Leu Asp Ser Phe Gly Gly Thr Glu His  
580 585 590

Asn Thr Thr Ser Gly Asn Ala Ile Gly Phe Ser Leu Pro Gln Asp Ala  
595 600 605

Leu Gly Gly Thr Thr Asp Thr Lys Ser Arg Ser Asp Val Lys Leu Ser  
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His Leu Ala Ser Asn Ile Asp Ser Gly Ser Ser Ile Gln Thr Thr Glu  
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Met Arg Leu Ala Asp Leu Leu Asp Ser Thr Leu Trp Asn Arg Lys Leu  
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Ala Pro Ser Ser Glu Arg Ile Val Tyr Ala Leu Val Gln Gln Ile Phe  
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Cys Phe Leu Leu Met Pro Ile Val Asp Lys Leu Pro Ala Leu Leu Arg  
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Ile Glu Leu Arg Arg Ile Lys Arg Ile Lys Glu Lys Phe Arg Val Met  
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Ser Lys Met Gln Ser His Ser Lys Asp Pro Ile Asn Ala Glu Ser Arg  
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Ser Arg Phe Glu Ala Tyr Asn Arg Leu Gln Ala Ala Ala Val Ala Phe  
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Gly Glu Lys Leu Pro Ile Pro Glu Ile Val Ala Ile Gly Gly Gln Ser  
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Asp Gly Lys Ser Ser Leu Leu Glu Ala Leu Leu Gly Phe Arg Phe Asn  
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Val Arg Glu Val Glu Met Gly Thr Arg Arg Pro Leu Ile Leu Gln Met  
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Val His Asp Leu Ser Ala Leu Glu Pro Arg Cys Arg Phe Gln Ile Ser  
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Arg Ile Phe Phe Val Glu Leu Ala Ile Leu Ile Thr Asp Leu Asp Glu  
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Asp Ser Glu Glu Tyr Gly Ser Pro Ile Val Ser Ala Thr Ala Val Ala  
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Asp Val Ile Arg Ser Arg Thr Glu Ala Leu Leu Lys Lys Thr Lys Thr  
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Ala Val Ser Pro Lys Pro Ile Val Met Arg Ala Glu Tyr Ala His Cys  
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Pro Asn Leu Thr Ile Ile Asp Thr Pro Gly Phe Val Leu Lys Ala Lys  
195 200 205

Lys Gly Glu Pro Glu Thr Thr Pro Asp Glu Ile Leu Ser Met Val Lys  
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Ser Leu Ala Ser Pro Pro His Arg Ile Leu Leu Phe Leu Gln Gln Ser  
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Ser Val Glu Trp Cys Ser Ser Leu Trp Leu Asp Ala Val Arg Glu Ile  
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Asp Ser Ser Phe Arg Arg Thr Ile Val Val Val Ser Lys Phe Asp Asn  
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Arg Leu Lys Glu Phe Ser Asp Arg Gly Glu Val Asp Arg Tyr Leu Ser  
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Ala Ser Gly Tyr Leu Gly Glu Asn Thr Arg Pro Tyr Phe Val Ala Leu  
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Pro Lys Asp Arg Ser Thr Ile Ser Asn Asp Glu Phe Arg Arg Gln Ile  
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Ser Gln Val Asp Thr Glu Val Ile Arg His Leu Arg Glu Gly Val Lys  
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Gly Gly Phe Asp Glu Glu Lys Phe Arg Ser Cys Ile Gly Phe Gly Ser  
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Leu Arg Asp Phe Leu Glu Ser Glu Leu Gln Lys Arg Tyr Lys Glu Ala  
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Ala Pro Ala Thr Leu Ala Leu Leu Glu Glu Arg Cys Ser Glu Val Thr  
370 375 380

Asp Asp Met Leu Arg Met Asp Met Lys Ile Gln Ala Thr Ser Asp Val  
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His Val Gly Ala Leu Ile Asp Gly Ala Ala Asn Pro Ala Pro Glu Gln  
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Trp Gly Lys Thr Thr Glu Glu Glu Arg Gly Glu Ser Gly Ile Gly Ser  
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Trp Pro Gly Val Ser Val Asp Ile Lys Pro Pro Asn Ala Val Leu Lys  
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Glu Lys Lys Thr Glu Asn Met Asp Gly Tyr Val Gly Phe His Ala Ala  
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580 585 590

Lys Gln Leu Val Arg His His Leu Asp Ser Val Thr Ser Pro Tyr Ser  
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Met Ala Cys Tyr Glu Asn Asn Tyr His Gln Gly Gly Ala Phe Gly Ala  
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Tyr Asn Lys Phe Asn Gln Ala Ser Pro Asn Ser Phe Cys Phe Glu Leu  
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Ser Asp Thr Ser Arg Asp Glu Pro Met Lys Asp Gln Glu Asn Ile Pro  
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Pro Glu Lys Asn Asn Gly Gln Glu Thr Thr Pro Gly Lys Gly Gly Glu  
660 665 670

Ser His Ile Thr Val Pro Glu Thr Pro Ser Pro Asp Gln Pro Cys Glu  
675 680 685

Ile Val Tyr Gly Leu Val Lys Lys Glu Ile Gly Asn Gly Pro Asp Gly  
690 695 700

Val Gly Ala Arg Lys Arg Met Ala Arg Met Val Gly Asn Arg Asn Ile  
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Glu Pro Phe Arg Val Gln Asn Gly Gly Leu Met Phe Ala Asn Ala Asp  
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Asn Gly Met Lys Ser Ser Ser Ala Tyr Ser Glu Ile Cys Ser Ser Ala  
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Ala Gln His Phe Ala Arg Ile Arg Glu Val Leu Val Glu Arg Ser Val  
755 760 765

Thr Ser Thr Leu Asn Ser Gly Phe Leu Thr Pro Cys Arg Asp Arg Leu  
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Met Asp Met Phe Val Ala Pro Gly Ala Ile Val Val Leu Gln Asn Glu  
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Leu Gln Ala Ala Ala Val Ala Phe Gly Glu Lys Leu Pro Ile Pro Glu  
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Ile Val Ala Ile Gly Gly Gln Ser Asp Gly Lys Ser Ser Leu Leu Glu  
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Ala Leu Leu Gly Phe Arg Phe Asn Val Arg Glu Val Glu Met Gly Thr  
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Arg Arg Pro Leu Ile Leu Gln Met Val His Asp Leu Ser Ala Leu Glu  
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Pro Arg Cys Arg Phe Gln Asp Glu Asp Ser Glu Glu Tyr Gly Ser Pro  
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Ile Val Ser Ala Thr Ala Val Ala Asp Val Ile Arg Ser Arg Thr Glu  
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Ala Leu Leu Lys Lys Thr Lys Thr Ala Val Ser Pro Lys Pro Ile Val  
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Met Arg Ala Glu Tyr Ala His Cys Pro Asn Leu Thr Ile Ile Asp Thr  
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Pro Gly Phe Val Leu Lys Ala Lys Lys Gly Glu Pro Glu Thr Thr Pro  
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Asp Glu Ile Leu Ser Met Val Lys Ser Leu Ala Ser Pro Pro His Arg  
195 200 205

Ile Leu Leu Phe Leu Gln Gln Ser Ser Val Glu Trp Cys Ser Ser Leu  
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Trp Leu Asp Ala Val Arg Glu Ile Asp Ser Ser Phe Arg Arg Thr Ile  
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Thr Arg Pro Tyr Phe Val Ala Leu Pro Lys Asp Arg Ser Thr Ile Ser  
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Asn Asp Glu Phe Arg Arg Gln Ile Ser Gln Val Asp Thr Glu Val Ile  
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Arg His Leu Arg Glu Gly Val Lys Gly Gly Phe Asp Glu Glu Lys Phe  
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Arg Ser Cys Ile Gly Phe Gly Ser Leu Arg Asp Phe Leu Glu Ser Glu  
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Leu Gln Lys Arg Tyr Lys Glu Ala Ala Pro Ala Thr Leu Ala Leu Leu  
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Lys Ile Gln Ala Thr Ser Asp Val Ala His Leu Arg Lys Ala Ala Met  
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Asp Ser Val Thr Ser Pro Tyr Ser Met Ala Cys Tyr Glu Asn Asn Tyr  
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His Gln Gly Gly Ala Phe Gly Ala Tyr Asn Lys Phe Asn Gln Ala Ser  
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Pro Asn Ser Phe Cys Phe Glu Leu Ser Asp Thr Ser Arg Asp Glu Pro  
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Pro Ser Pro Asp Gln Pro Cys Glu Ile Val Tyr Gly Leu Val Lys Lys  
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675 680 685

Arg Met Val Gly Asn Arg Asn Ile Glu Pro Phe Arg Val Gln Asn Gly  
690 695 700

Gly Leu Met Phe Ala Asn Ala Asp Asn Gly Met Lys Ser Ser Ser Ala  
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Tyr Ser Glu Ile Cys Ser Ser Ala Ala Gln His Phe Ala Arg Ile Arg  
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Leu Thr Pro Cys Arg Asp Arg Leu Val Val Ala Leu Gly Leu Asp Leu  
755 760 765

Phe Ala Val Asn Asp Asp Lys Phe Met Asp Met Phe Val Ala Pro Gly  
770 775 780

Ala Ile Val Val Leu Gln Asn Glu Arg Gln Gln Leu Gln Lys Arg Gln  
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Asp Arg Ser Leu  
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20 25 30

Ala Arg Asn Ser Arg Asp Asn Ser Ser Ala Asp Asp Phe Met Lys Ile  
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His Ala Ala Tyr Cys Thr Leu Ser Asp Pro Glu Lys Arg Ala Val Tyr  
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Asp Arg Arg Thr  
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<210> 89

<211> 63

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<213> *Mycoplasma pneumoniae*

<400> 89

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Asn Lys Gln Gly Ala Asp Thr Phe Val Lys Ile Asn Asn Ala Tyr Ala  
35 40 45

Val Leu Ser Asp Thr Thr Gln Lys Ala Glu Tyr Asp Ala Met Leu  
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<213> *Mycoplasma genitalium*

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20 25 30

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<210> 91  
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<213> *Arabidopsis thaliana*

<400> 91

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20 25 30

Ser Pro Pro Asp Arg Val Glu Glu Tyr Thr Asp Arg Phe Ile Arg Val  
35 40 45

Gln Glu Ala Tyr Glu Thr Leu Ser Asp Pro Arg Arg Arg Val Leu Tyr  
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Asp Arg Asp Leu  
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<400> 92

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20 25 30

His Arg Gly Ala Glu Ala Lys Ala Ala Ala Glu Thr Gln Phe Lys Leu  
35 40 45

Val Ala Thr Ala Tyr Glu Ile Leu Arg Asp Glu Glu Ser Arg Thr Asp  
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Tyr Asp Tyr Met Leu  
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<213> *Caenorhabditis elegans*  
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Lys Leu Ala Lys Ala Tyr Arg Ala Leu Ala Arg Lys His His Pro Asp  
20 25 30

Arg Val Lys Asn Lys Glu Glu Lys Leu Leu Ala Glu Glu Arg Phe Arg  
35 40 45

Val Ile Ala Thr Ala Tyr Glu Thr Leu Lys Asp Asp Glu Ala Lys Thr  
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Asn Tyr Asp Tyr Tyr Leu  
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<400> 94

Ser Pro Tyr Asp Thr Leu Glu Leu Asp Arg Asn Ala Glu Glu Gln  
1 5 10 15

Ile Lys Val Ala Tyr Arg Arg Leu Ala Lys Phe Tyr His Pro Asp Val  
20 25 30

Tyr Asp Gly Lys Gly Thr Leu Glu Glu Gly Glu Thr Ala Glu Ala Arg  
35 40 45

Phe Ile Lys Ile Gln Ala Ala Tyr Glu Leu Leu Met Asp Ser Glu Lys  
50 55 60

Lys Val Gln Tyr Asp Met Asp Asn  
65 70

<210> 95  
<211> 68  
<212> PRT  
<213> Schizosaccharomyces pombe  
  
<400> 95

Lys Leu Tyr Asp Ile Leu Glu Val His Phe Glu Ala Ser Ala Glu Glu  
1 5 10 15

Ile Lys Lys Ser Tyr Lys Arg Leu Ala Leu Leu His His Pro Asp Lys  
20 25 30

Ala Pro Ile His Glu Lys Glu Ala Ala Glu Arg Phe Arg Gly Val  
35 40 45

Gln Glu Ala Tyr Asp Ile Leu Lys Asp Pro Glu Ser Arg Glu Met Tyr  
50 55 60

Asp Met Tyr Gly  
65

<210> 96  
<211> 66  
<212> PRT  
<213> Unknown  
  
<220>  
<223> Synthetic  
  
<400> 96

Asp Phe Tyr Lys Ile Leu Gly Ala Glu Pro His Phe Leu Gly Asp Gly  
1 5 10 15

Ile Arg Arg Ala Phe Glu Ser Arg Ile Ala Lys Pro Pro Gln Tyr Gly  
20 25 30

Tyr Ser Thr Glu Ala Leu Ala Gly Arg Arg Gln Met Leu Gln Ile Ala  
35 40 45

His Asp Thr Leu Thr Asn Gln Ser Ser Arg Thr Glu Tyr Asp Arg Ala  
50 55 60

Leu Ser  
65

<210> 97  
<211> 66  
<212> PRT  
<213> Oryza sativa

<400> 97

Asp Phe Tyr Lys Val Leu Gly Ala Glu Pro His Phe Leu Gly Asp Gly  
1 5 10 15

Ile Arg Arg Ala Phe Glu Ala Arg Ile Ala Lys Pro Pro Gln Tyr Gly  
20 25 30

Tyr Ser Thr Asp Ala Leu Val Gly Arg Arg Gln Met Leu Gln Ile Ala  
35 40 45

His Asp Thr Leu Met Asn Gln Asn Ser Arg Thr Gln Tyr Asp Arg Ala  
50 55 60

Leu Ser  
65

<210> 98  
<211> 66  
<212> PRT  
<213> Solanum tuberosum

<400> 98

Asp Phe Tyr Arg Val Leu Gly Ala Glu Ala His Phe Leu Gly Asp Gly  
1 5 10 15

Ile Arg Arg Cys Tyr Asp Ala Arg Ile Thr Lys Pro Pro Gln Tyr Gly  
20 25 30

Tyr Ser Gln Glu Ala Leu Ile Gly Arg Arg Gln Ile Leu Gln Ala Ala  
35 40 45

Cys Glu Thr Leu Ala Asp Ser Thr Ser Arg Arg Glu Tyr Asn Gln Gly  
50 55 60

Leu Ala  
65

<210> 99  
<211> 66  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Synthetic  
  
<400> 99

Asp Leu Tyr Lys Ile Leu Gly Ala Glu Thr His Phe Leu Gly Asp Gly  
1 5 10 15

Ile Arg Arg Ala Tyr Glu Ala Lys Phe Ser Lys Pro Pro Gln Tyr Ala  
20 25 30

Phe Ser Asn Glu Ala Leu Ile Ser Arg Arg Gln Ile Leu Gln Ala Ala  
35 40 45

Cys Glu Thr Leu Ala Asp Pro Ala Ser Arg Arg Glu Tyr Asn Gln Ser  
50 55 60

Leu Val  
65

<210> 100  
<211> 66  
<212> PRT  
<213> Arabidopsis thaliana  
  
<400> 100

Asp Phe Tyr Gln Val Leu Gly Ala Gln Thr His Phe Leu Thr Asp Gly  
1 5 10 15

Ile Arg Arg Ala Phe Glu Ala Arg Val Ser Lys Pro Pro Gln Phe Gly  
20 25 30

Phe Ser Asp Asp Ala Leu Ile Ser Arg Arg Gln Ile Leu Gln Ala Ala  
35 40 45

Cys Glu Thr Leu Ser Asn Pro Arg Ser Arg Arg Glu Tyr Asn Glu Gly  
50 55 60

Leu Leu  
65

<210> 101  
<211> 66  
<212> PRT  
<213> Protochlorococcus marinus MED4  
  
<400> 101

Asp His Phe Arg Leu Ile Gly Val Ser Pro Ser Ala Thr Ser Glu Glu  
1 5 10 15

Ile Leu Arg Ala Phe Gln Leu Arg Leu Asp Lys Thr Pro Asp Glu Gly  
20 25 30

Phe Thr Tyr Glu Val Leu Thr Gln Arg Ser Glu Leu Leu Arg Leu Thr  
35 40 45

Ala Asp Leu Leu Thr Asp Pro Asp Ser Arg Arg Asp Tyr Glu Asn Leu  
50 55 60

Leu Leu  
65

<210> 102  
<211> 66  
<212> PRT  
<213> Protochlorococcus marinus MT9313  
  
<400> 102

Asp His Phe Arg Leu Leu Gly Val Ser Pro Ser Ala Asp Ser Glu Ala  
1 5 10 15

Ile Leu Arg Ala Leu Glu Leu Arg Leu Asp Arg Cys Pro Asp Gln Gly  
20 25 30

Phe Thr His Glu Val Leu Ile Gln Arg Ala Glu Leu Leu Arg Leu Ser  
35 40 45

Ala Asp Leu Leu Thr Asp Pro Pro Arg Arg Gln Ala Tyr Glu Thr Ala  
50 55 60

Leu Leu  
65

<210> 103  
<211> 66  
<212> PRT  
<213> Synechocystis PCC6803

<400> 103

Asp His Phe Arg Leu Leu Gly Val Ser Pro Ser Ala Asp Pro Ala Ser  
1 5 10 15

Ile Leu Arg Arg Leu Gln Thr Arg Ser Asp Ser Pro Pro Asp Asp Gly  
20 25 30

Phe Thr His Glu Gly Leu Leu Gln Arg Gln Ala Leu Leu His Arg Ser  
35 40 45

Ala Asp Leu Leu Thr Asp Pro Ser Glu Arg Ala Asp Tyr Glu Ala Ala  
50 55 60

Leu Leu  
65

<210> 104  
<211> 66  
<212> PRT  
<213> Synechocystis PCC6803

<400> 104

Asp Phe Tyr Arg Ile Leu Gly Ile Pro Pro Gln Ser Gly Gly Glu Thr  
1 5 10 15

Ile Glu Gln Ala Tyr Gln Asp Arg Leu Leu Gln Leu Pro Arg Arg Glu  
20 25 30

Phe Ser Asp Ala Ala Val Thr Leu Arg Asn Gln Leu Leu Ala Ile Ala  
35 40 45

Tyr Glu Thr Leu Arg Asp Pro Glu Lys Arg Gln Ala Tyr Asp Gln Glu  
50 55 60

Trp Trp  
65

<210> 105  
<211> 66  
<212> PRT  
<213> Nostoc punctiforme

<400> 105

Asp Tyr Tyr Arg Ile Leu Gly Leu Pro Leu Ala Ala Ser Glu Glu Gln  
1 5 10 15

Leu Arg Gln Ala Tyr Ser Asp Arg Ile Val Gln Leu Pro Arg Arg Glu  
20 25 30

Tyr Ser Gln Ala Ala Ile Ser Ser Arg Lys Gln Leu Ile Glu Glu Ala  
35 40 45

Tyr Val Val Leu Ser Asp Pro Lys Gln Arg Ser Thr Tyr Asp Gln Leu  
50 55 60

Tyr Leu  
65

<210> 106  
<211> 66  
<212> PRT  
<213> Anabaena PCC7120

<400> 106

Asp Tyr Tyr Arg Ile Leu Gly Leu Pro Leu Ala Ala Ser Asp Glu Gln  
1 5 10 15

Leu Arg Gln Ala Tyr Ser Asp Arg Ile Val Gln Leu Pro Arg Arg Glu  
20 25 30

Tyr Ser Gln Ala Ala Ile Ala Ser Arg Lys Gln Leu Ile Glu Glu Ala  
35 40 45

Tyr Val Val Leu Ser Asp Pro Lys Glu Arg Ser Ser Tyr Asp Gln Leu  
50 55 60

Tyr Leu  
65

<210> 107  
<211> 66  
<212> PRT  
<213> Bombyx mori

<400> 107

Asp Tyr Tyr Ala Leu Leu Gly Cys Asp Glu Asn Ser Thr Val Glu Gln  
1 5 10 15

Ile Thr Ala Glu Tyr Lys Ile Leu Ala Leu Gln His His Pro Asp Lys  
20 25 30

Asn Asp Gly Glu Lys Glu Ala Glu Met Lys Phe Gln Lys Leu Lys Glu  
35 40 45

Ala Lys Glu Ile Leu Cys Asp Pro Ser Lys Arg Ala Leu Tyr Asp Lys  
50 55 60

Trp Arg  
65

<210> 108  
<211> 66  
<212> PRT  
<213> Drosophila melanogaster

<400> 108

Asp Phe Tyr Gly Leu Leu His Cys Asp Glu Asn Ser Ser Pro Glu Gln  
1 5 10 15

Ile Gln Ala Glu Tyr Lys Val Leu Ala Leu Gln Tyr His Pro Asp Lys  
20 25 30

Asn Ser Gly Asp Lys Glu Ala Glu Ala Lys Phe Gln Gln Leu Lys Glu  
35 40 45

Ala Lys Glu Thr Leu Cys Asp Pro Glu Lys Arg Ala Ile Tyr Asp Lys  
50 55 60

Trp Arg  
65

<210> 109  
<211> 66  
<212> PRT  
<213> *Mus musculus*

<400> 109

Asp Tyr Tyr Ala Leu Leu Gly Cys Asp Glu Leu Ser Ser Val Glu Gln  
1 5 10 15

Ile Leu Ala Glu Phe Lys Ile Arg Ala Leu Glu Cys His Pro Asp Lys  
20 25 30

His Pro Glu Asn Ser Lys Ala Val Glu Thr Phe Gln Lys Leu Gln Lys  
35 40 45

Ala Lys Glu Ile Leu Cys Asn Ala Glu Ser Arg Ala Arg Tyr Asp His  
50 55 60

Trp Arg  
65

<210> 110  
<211> 65  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 110

Asp Ala Tyr Ser Ile Leu Gly Val Pro Pro Asp Ser Ser Gln Glu Gln  
1 5 10 15

Ile Arg Lys His Tyr Lys Lys Ile Ala Val Leu Val His Pro Asp Lys  
20 25 30

Asn Lys Gln Ala Gly Ala Glu Glu Ala Phe Lys Val Leu Gln Arg Ala  
35 40 45

Phe Glu Leu Ile Gly Glu Pro Glu Asn Arg Leu Ile Tyr Asp Gln Ser  
50 55 60

Ile  
65

<210> 111  
<211> 64  
<212> PRT  
<213> Leishmania major

<400> 111

Glu Leu Tyr Gln Val Leu Glu Leu Asp Ala Gln Cys Thr Thr Ala Glu  
1 5 10 15

Ile Ser Gln Gln Tyr Arg Arg Leu Ala Leu Arg Tyr His Pro Asp Arg  
20 25 30

Asn Ala Gly Ala Thr Val Glu Gln Phe Gln Arg Ile Glu Glu Ala His  
35 40 45

Arg Val Leu Ser Asp Leu Arg Gln Arg Gln Leu Tyr Asp Thr Val Gly  
50 55 60

<210> 112  
<211> 67  
<212> PRT  
<213> Schizosaccharomyces pombe

<400> 112

Asp Tyr Tyr Thr Ile Leu Gly Ala Glu Ser Thr Ser Ser Tyr Val Glu  
1 5 10 15

Ile Arg Gln Gln Tyr Leu Lys Leu Val Leu Arg Tyr His Pro Asp Arg  
20 25 30

Asn Pro Gly Arg Glu Ala Glu Val Leu Pro Gln Phe Gln Leu Ile Gln  
35 40 45

Lys Ala His Glu Val Leu Lys Asp Pro Lys Leu Arg Glu Leu Phe Asp  
50 55 60

Gln Arg Arg  
65

<210> 113  
<211> 67  
<212> PRT  
<213> Schizosaccharomyces pombe  
  
<400> 113

Asp Tyr Tyr Ala Ile Leu Lys Leu Gln Lys Asn Ala Thr Phe Gln Gln  
1 5 10 15

Ile Arg Lys Gln Tyr Leu Phe Leu Ala Leu Gln Tyr His Pro Asp Arg  
20 25 30

Asn Pro Gly Asp Glu Glu Arg Ala Val Lys Arg Phe Gln Arg Leu Gln  
35 40 45

Leu Ala His Glu Val Leu Ser Asp Ala Thr Lys Arg Leu Ile Tyr Asp  
50 55 60

Gln Leu Phe  
65

<210> 114  
<211> 68  
<212> PRT  
<213> Schizosaccharomyces pombe  
  
<400> 114

Asn His Tyr Ser Val Leu Asn Leu Lys Asp Gly Lys Thr Tyr Thr Asp  
1 5 10 15

Asp Glu Ile Lys Glu Ala Tyr Arg Lys Ala Leu Leu Leu Phe His Pro  
20 25 30

Asp Lys Cys Lys Glu Lys Pro Ser Val Val Tyr Thr Ile Asp Gln Val  
35 40 45

Lys Glu Ala Tyr Gln Val Leu Ser Ser Glu Lys Asp Arg Gln Gln Tyr  
50 55 60

Gln Ile Lys Gln  
65

<210> 115  
<211> 652  
<212> PRT  
<213> Anabaena PCC7120

<400> 115

Gln Gly Lys Tyr Ala Val Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu  
1 5 10 15

Gly Leu Pro Leu Ala Ala Ser Asp Glu Gln Leu Arg Gln Ala Tyr Ser  
20 25 30

Asp Arg Ile Val Gln Leu Pro Arg Arg Glu Tyr Ser Gln Ala Ala Ile  
35 40 45

Ala Ser Arg Lys Gln Leu Ile Glu Glu Ala Tyr Val Val Leu Ser Asp  
50 55 60

Pro Lys Glu Arg Ser Ser Tyr Asp Gln Leu Tyr Leu Ala His Ala Tyr  
65 70 75 80

Asp Pro Asp Asn Ala Ala Thr Thr Lys Val Ala Val Glu Asn Arg Gly  
85 90 95

Asp Ser Asn Asn Gly His Phe Asp Val Gln Ser Leu Ser Ile Glu Val  
100 105 110

Ser Ser Glu Glu Leu Ile Gly Ala Leu Leu Ile Leu Gln Glu Leu Gly  
115 120 125

Glu Tyr Glu Leu Val Leu Lys Leu Gly Arg Asn Tyr Leu Gly Asn Gln  
130 135 140

Asn Gly Thr Ala Ser Thr Arg Asn Gly Asn His Arg Thr Pro Glu Glu  
145 150 155 160

Phe Leu Asp Ser Ser Glu Arg Pro Asp Ile Leu Leu Thr Val Ala Leu  
165 170 175

Ala Ser Leu Glu Leu Gly Arg Glu Gln Trp Gln Gln Gly His Tyr Glu  
180 185 190

Asn Ala Ala Leu Ser Leu Glu Thr Gly Gln Glu Val Leu Phe Ser Glu  
195 200 205

Gly Ile Phe Pro Ser Val Gln Ala Glu Ile Gln Ala Asp Leu Tyr Lys  
210 215 220

Leu Arg Pro Tyr Arg Ile Leu Glu Leu Leu Ala Leu Pro Gln Glu Lys  
225 230 235 240

Thr Ile Glu Arg His Gln Gly Leu Asp Leu Leu Gln Ser Ile Leu Asp  
245 250 255

Asp Arg Gly Gly Ile Asp Gly Thr Gly Asn Asp Gln Ser Gly Leu Asn  
260 265 270

Ile Asp Asp Phe Leu Arg Phe Ile Gln Gln Leu Arg His His Leu Thr  
275 280 285

Val Ala Glu Gln His Lys Leu Phe Asp Gly Glu Ser Lys Arg Pro Ser  
290 295 300

Ala Val Ala Thr Tyr Leu Ala Val Tyr Ala Ser Ile Ala Arg Gly Phe  
305 310 315 320

Thr Gln Arg Gln Pro Ala Leu Ile Arg His Ala Lys Gln Ile Leu Met  
325 330 335

Arg Leu Ser Lys Arg Gln Asp Val His Leu Glu Gln Ser Leu Cys Ala  
340 345 350

Leu Leu Leu Gly Gln Thr Glu Glu Ala Thr Arg Val Leu Glu Leu Ser  
355 360 365

Gln Glu Tyr Glu Ala Leu Ala Leu Ile Arg Glu Lys Ser Gln Asp Ser  
370 375 380

Pro Asp Leu Leu Pro Gly Leu Cys Leu Tyr Ala Glu Gln Trp Leu Gln  
385 390 395 400

Asn Glu Val Phe Pro His Phe Arg Asp Leu Ser Arg Gln Gln Ala Ser  
405 410 415

Leu Lys Asp Tyr Phe Ala Asn Gln Gln Val Gln Ala Tyr Leu Glu Ala  
420 425 430

Leu Pro Asn Asp Ala Glu Thr Thr Asn Glu Trp Ala Val Ile Asn Arg  
435 440 445

Gln Ser Phe Ser Gln Pro Arg Gly Asn Ser Tyr Ser Gly Gly Thr Pro  
450 455 460

Val Ala Lys Arg Pro Val Gly Lys Ala Asn Arg Pro Gly Glu Ala Ser  
465 470 475 480

Thr Arg Pro Val Pro Gln Arg Ser His Pro Ser Glu Val Asn Arg Gln  
485 490 495

Phe His Gln Asn Arg Thr Pro Asp Pro Glu Leu Pro Glu Thr Ser Asn  
500 505 510

His Arg Arg Pro Glu Ser Ser Asn Phe Thr Thr Ala Arg Glu Asn Ile  
515 520 525

Ser Thr Thr Asp Ala Tyr Thr Asp Asn Tyr Pro Pro Glu Ile Pro Val  
530 535 540

Glu Arg Ala Ser Arg Pro Val Gln Pro Gly Val Ser Gly Tyr Thr Gln  
545 550 555 560

Ser Thr Pro Pro Arg Gln Thr Pro Lys Arg Arg Arg Arg Lys Lys Pro  
565 570 575

Gln Ala Val Val Asn Arg Gly His Ser Ile His Gln Gln Arg Gln Pro  
580 585 590

Ser Pro Ser Thr Leu Gly Arg Lys Thr Arg Leu Leu Trp Ile Val Leu  
595 600 605

Gly Ser Leu Gly Gly Ile Leu Leu Phe Trp Leu Ile Val Ser Thr Thr  
610 615 620

Phe Gly Trp Leu Lys Asn Val Phe Phe Pro Ala Pro Ser Leu Gln Gly  
625 630 635 640

Glu Gln Leu Ser Ile Gln Ile Ser Gln Pro Pro Leu  
645 650

<210> 116  
<211> 624

<212> PRT

<213> Nostoc punctiforme

<400> 116

Met Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu Gly Leu Pro Leu Ala  
1 5 10 15

Ala Ser Glu Glu Gln Leu Arg Gln Ala Tyr Ser Asp Arg Ile Val Gln  
20 25 30

Leu Pro Arg Arg Glu Tyr Ser Gln Ala Ala Ile Ser Ser Arg Lys Gln  
35 40 45

Leu Ile Glu Glu Ala Tyr Val Val Leu Ser Asp Pro Lys Gln Arg Ser  
50 55 60

Thr Tyr Asp Gln Leu Tyr Leu Ala His Ala Tyr Asp Pro Asp Asn Leu  
65 70 75 80

Ala Ala Ala Ala Val Ala Gln Glu Asn Arg Thr Glu Ser Thr Lys Arg  
85 90 95

Gly Ser Asp Thr Gln Ser Leu Gly Ile Glu Ile Thr Gln Asp Glu Leu  
100 105 110

Val Gly Ala Leu Leu Ile Leu Gln Glu Leu Gly Glu Tyr Glu Leu Val  
115 120 125

Leu Lys Leu Gly Arg Pro Tyr Leu Val Asn Lys Asn Ser Ala Thr Ser  
130 135 140

Ser Arg Lys Ser Asn Asn Leu Ala Asp Glu Glu Ile Tyr Glu Ser Ala  
145 150 155 160

Glu His Pro Asp Val Val Leu Thr Val Ala Leu Ala Cys Leu Glu Leu  
165 170 175

Gly Arg Glu Gln Trp Gln Gln Gly His Tyr Glu Asn Ala Ala Ile Ser  
180 185 190

Leu Glu Thr Gly Gln Glu Leu Leu Val Arg Glu Gly Leu Phe Ser Ser  
195 200 205

Ile Gln Ala Glu Ile Gln Ala Asp Leu Tyr Lys Leu Arg Pro Tyr Arg  
210 215 220

Ile Leu Glu Leu Leu Ala Leu Pro Gln Glu Lys Thr Ala Glu Arg Ser  
225 230 235 240

Gln Gly Leu Glu Leu Leu Gln Asn Leu Leu Glu Asp Arg Gly Gly Ile  
245 250 255

Asp Gly Thr Asn Asn Asp Glu Ser Gly Leu Asn Ile Asp Asp Phe Leu  
260 265 270

Arg Phe Ile Gln Gln Leu Arg Asn His Leu Thr Val Ala Glu Gln His  
275 280 285

Lys Leu Phe Glu Ala Gln Ser Lys Arg Ser Ser Ala Val Ala Thr Tyr  
290 295 300

Leu Ala Val Tyr Ala Leu Ile Ala Arg Gly Phe Ala Gln Arg Gln Pro  
305 310 315 320

Ala Leu Ile Arg Gln Ala Arg Gln Met Leu Val Arg Leu Gly Lys Arg  
325 330 335

Gln Asp Val His Leu Glu Gln Ser Leu Cys Ala Leu Leu Leu Gly Gln  
340 345 350

Thr Glu Glu Ala Thr Arg Val Leu Glu Leu Ser Gln Glu Tyr Glu Ala  
355 360 365

Leu Ala Phe Ile Arg Glu Lys Ser Gln Asp Ser Pro Asp Leu Leu Pro  
370 375 380

Gly Leu Cys Leu Tyr Ala Glu Gln Trp Leu Gln His Glu Val Phe Pro  
385 390 395 400

His Phe Arg Asp Leu Ala Asn Gln Gln Ala Phe Leu Lys Asp Tyr Phe  
405 410 415

Ala Asn Gln Gln Val Gln Ala Tyr Leu Glu Ala Leu Pro Thr Asp Ala  
420 425 430

Gln Thr Thr Asn Glu Trp Ala Val Ile Asn Pro Gln Tyr Phe Pro Gln  
435 440 445

Ala Lys Ala Lys Asn Thr His Phe His Asn Asn Ser Thr Lys Thr Ser  
450 455 460

Ala Ser Phe Asn His Ser Arg Val Pro Asn Pro Asp Leu Pro Glu Thr  
465 470 475 480

Pro Thr Lys Glu Thr Ser Glu Tyr Pro Asn Phe Ser Pro Pro Met Trp  
485 490 495

Ser Ser Ser Gly Ser Ile Lys Ser Glu Val Pro Ala Ala Glu Arg Met  
500 505 510

Ser Arg Gly Thr Asn Gln His Leu Asn Gly Ser Ala Lys Ser Ala Ala  
515 520 525

Ser Gly His Asn Gln Lys Arg Arg Arg Arg Lys Pro Thr Pro Ser Ala  
530 535 540

Ser Arg Glu Arg Ile Pro Asp Asn Arg Pro His Ser Arg Arg Pro Arg  
545 550 555 560

Arg Arg Arg Thr Phe Ala Asn Thr Ile Glu Gly Lys Thr Arg Leu Val  
565 570 575

Trp Arg Val Phe Ile Ser Leu Val Ser Ile Leu Val Phe Trp Val Leu  
580 585 590

Ala Thr Thr Thr Phe Gly Trp Leu Lys Asn Leu Phe Phe Pro Gln Pro  
595 600 605

Ser Pro Pro Asp Leu Gln Leu Phe Val Gln Ile Asn Gln Pro Pro Leu  
610 615 620

<210> 117  
<211> 557  
<212> PRT  
<213> *Protochlorococcus marinus* MED4

<400> 117

Met Glu Leu Pro Leu Asp His Phe Arg Leu Ile Gly Val Ser Pro Ser  
1 5 10 15

Ala Thr Ser Glu Glu Ile Leu Arg Ala Phe Gln Leu Arg Leu Asp Lys  
20 25 30

Thr Pro Asp Glu Gly Phe Thr Tyr Glu Val Leu Thr Gln Arg Ser Glu  
35 40 45

Leu Leu Arg Leu Thr Ala Asp Leu Leu Thr Asp Pro Asp Ser Arg Arg  
50 55 60

Asp Tyr Glu Asn Leu Leu Leu Asn Gly Ala Ser Gly Leu Asp Leu Ser  
65 70 75 80

Ser Asn Arg Glu Val Ala Gly Leu Ile Leu Leu Trp Glu Ser Gly Ser  
85 90 95

Ser Lys Glu Ala Phe Lys Ile Thr Arg Lys Ala Leu Gln Pro Pro Gln  
100 105 110

Thr Pro Ala Leu Gly Ser Ser Arg Glu Ala Asp Leu Thr Leu Leu Ala  
115 120 125

Ala Leu Thr Ser Arg Asp Ala Ala Ile Gln Glu Gln Asp Gln Arg Ser  
130 135 140

Tyr Ser Asn Ala Ala Asp Phe Leu Gln Glu Gly Ile Gln Leu Leu Gln  
145 150 155 160

Arg Met Gly Lys Leu Gly Glu Leu Arg Lys Thr Leu Glu Glu Asp Leu  
165 170 175

Val Ser Leu Leu Pro Tyr Arg Ile Leu Asp Leu Leu Ser Arg Asp Leu  
180 185 190

Asn Asp Tyr Asp Ser His Lys Lys Gly Leu Ser Met Leu Glu Asn Leu  
195 200 205

Ile Ile Lys Arg Gly Gly Leu Glu Gly Lys Asn Lys Ser Glu Tyr Asn  
210 215 220

Asp Phe Leu Asn Gln Gln Glu Phe Glu Ser Phe Phe Gln Gln Ile Lys  
225 230 235 240

Pro Phe Leu Thr Val Gln Asp Gln Ile Asp Leu Phe Leu Glu Leu Gln  
245 250 255

Lys Arg Gly Ser Ser Glu Ala Gly Phe Leu Ala Phe Leu Ser Leu Thr  
260 265 270

Ala Ile Gly Phe Ala Arg Arg Lys Pro Ala Lys Leu Phe Glu Ala Arg  
275 280 285

Lys Ile Leu Lys Lys Leu Asn Leu Ser Gly Leu Asp Ser Met Pro Leu  
290 295 300

Ile Gly Cys Leu Asp Leu Leu Leu Ala Asp Val Glu Gln Ser Ser Ala  
305 310 315 320

Arg Phe Leu Ser Ser Asp Glu Lys Leu Arg Asp Trp Leu Asn Asn  
325 330 335

Tyr Pro Gly Glu Lys Leu Glu Ala Ile Cys Ile Phe Cys Lys Asn Trp  
340 345 350

Leu Glu Asn Asp Val Leu Val Gly Tyr Arg Asp Ile Asp Leu Lys Glu  
355 360 365

Ile Asp Leu Asp Ser Trp Phe Glu Asp Arg Glu Ile Gln Glu Phe Ile  
370 375 380

Glu Gln Ile Glu Lys Lys Ser Asn Arg Thr Val Phe Lys Ser Gly Pro  
385 390 395 400

Gln Asn Lys Pro Ile Phe Gln Ala Gln Glu Ser Leu Lys Asp Ser Ser  
405 410 415

Thr Gly Pro Asp Leu Asn Ser Asp Asn Phe Glu Glu Gly Arg Leu Pro  
420 425 430

Leu Pro Gly Gly Val Arg Glu Asp Gly Gln Glu Val Ile Glu Glu Asn  
435 440 445

Ile Tyr Thr Asp Glu Ile Ile Lys Asn Lys Ser Ile Glu Phe Tyr Lys  
450 455 460

Tyr Ala Ile Glu Lys Ile Ala Glu Leu Lys Phe Val Phe Gly Glu Ala  
465 470 475 480

Leu Glu Asn Tyr Arg Ile Phe Asn Lys Ser Ser Tyr Leu Thr Tyr Leu  
485 490 495

Tyr Ala Phe Leu Ile Leu Phe Ala Phe Gly Leu Gly Val Gly Phe Val  
500 505 510

Arg Asn Asn Leu Lys Lys Pro Val Gln Glu Lys Glu Ile Ile Asp Asn  
515 520 525

Ser Leu Ser Ile Asn Glu Asn Lys Asn Val Phe Tyr Glu Gly Leu Asn  
530 535 540

Gln Asp Asp Lys Lys Lys Val Leu Asp Asn Ser Lys Ile  
545 550 555

<210> 118  
<211> 524  
<212> PRT  
<213> *Protochlorococcus marinus* MT9313

<400> 118

Met Ala Ala Gln Leu Val Asp Leu Pro Ile Asp His Phe Arg Leu Leu  
1 5 10 15

Gly Val Ser Pro Ser Ala Asp Ser Glu Ala Ile Leu Arg Ala Leu Glu  
20 25 30

Leu Arg Leu Asp Arg Cys Pro Asp Gln Gly Phe Thr His Glu Val Leu  
35 40 45

Ile Gln Arg Ala Glu Leu Leu Arg Leu Ser Ala Asp Leu Leu Thr Asp  
50 55 60

Pro Pro Arg Arg Gln Ala Tyr Glu Thr Ala Leu Leu Glu Leu Ser Arg  
65 70 75 80

Asp His Pro Gly Glu Thr Ala Gly Leu Asp Val Ser Pro Ser Arg Glu  
85 90 95

Val Ala Gly Leu Ile Leu Leu Phe Glu Ala Asn Ser Ser His Glu Val  
100 105 110

Phe His Leu Ala Ser Gln Gly Leu Gln Pro Pro Gln Ser Pro Thr Leu  
115 120 125

Gly Ser Glu Arg Glu Ala Asp Leu Ala Leu Leu Ala Leu Ala Cys  
130 135 140

Arg Ala Ala Ala Ala Glu Glu Gln Gln Arg Arg Tyr Glu Ala Ala  
145 150 155 160

Ala Ser Leu Leu His Asp Gly Ile Gln Leu Leu Gln Arg Met Gly Lys  
165 170 175

Leu Ser Glu Glu Cys His Lys Leu Glu Asn Asp Leu Asp Ala Leu Leu  
180 185 190

Pro Tyr Arg Ile Leu Asp Leu Leu Ser Arg Asp Leu Gly Asp Gln Val  
195 200 205

Ser His Gln Glu Gly Leu Arg Leu Leu Asp Asn Phe Val Ser Gln Arg  
210 215 220

Gly Gly Leu Glu Gly Thr Ala Pro Ser Pro Ala Pro Gly Gly Leu Asp  
225 230 235 240

Gln Ser Glu Phe Asp Asn Phe Phe Lys Gln Ile Arg Lys Phe Leu Thr  
245 250 255

Val Gln Glu Gln Val Asp Leu Phe Leu Arg Trp Gln Gln Ala Gly Ser  
260 265 270

Ala Asp Ala Gly Phe Leu Gly Gly Leu Ala Leu Ala Ala Val Gly Phe  
275 280 285

Ser Arg Arg Lys Pro Glu Arg Val Gln Glu Ala Arg Gln His Leu Glu  
290 295 300

Arg Leu Gln Leu Asp Gly Cys Asp Pro Leu Pro Met Leu Gly Cys Leu  
305 310 315 320

Asp Leu Leu Leu Gly Asp Val Gly Arg Ala Gln Glu Arg Phe Leu Arg  
325 330 335

Ser Thr Asp Pro Arg Val Lys Asp Cys Leu Asn Ser His Pro Gly Asp  
340 345 350

Glu Leu Ala Ala Phe Cys Glu Tyr Cys Arg Ser Trp Leu Arg Gly Asp  
355 360 365

Val Leu Pro Gly Tyr Arg Asp Val Asp Ala Glu Ala Val Asp Leu Glu  
370 375 380

Ala Trp Phe Ala Asp Arg Asp Val Gln Ala Tyr Val Glu Arg Leu Glu  
385 390 395 400

Arg Ser Glu Asn Arg Ala Ser Ser Leu Gly Lys Ala Phe Ser Gly Ser  
405 410 415

Ser Val Lys Gln Pro Phe Pro Trp Ala Pro Leu Asp Pro Asp Gly Ile  
420 425 430

Leu Pro Leu Ser Leu Gly Gly Pro Asp Val Gly Gln Pro Ala Ala Asp  
435 440 445

Gln Ser Ser Asp Glu Phe Ala Ser Asp Gly Met Ala Trp Ile Asp Arg  
450 455 460

Leu Ala Asp Leu Pro Arg Pro Thr Arg Pro Val Leu Ile Gly Ser Val  
465 470 475 480

Val Phe Ala Ala Leu Ile Ala Ala Phe Ala Gly Phe Ser Leu Phe Gly  
485 490 495

Gln Arg Pro Arg Thr Ser Val Ser Thr Ala Ala Asp Gln Pro Gln Val  
500 505 510

Thr Ala Pro Pro Thr Ala Thr Leu Gln Glu Glu Val  
515 520

<210> 119  
<211> 566  
<212> PRT  
<213> Synechocystis PCC6803

<400> 119

Met Phe Ile Pro Leu Asp Phe Tyr Arg Ile Leu Gly Ile Pro Pro Gln  
1 5 10 15

Ser Gly Gly Glu Thr Ile Glu Gln Ala Tyr Gln Asp Arg Leu Leu Gln  
20 25 30

Leu Pro Arg Arg Glu Phe Ser Asp Ala Ala Val Thr Leu Arg Asn Gln  
35 40 45

Leu Leu Ala Ile Ala Tyr Glu Thr Leu Arg Asp Pro Glu Lys Arg Gln  
50 55 60

Ala Tyr Asp Gln Glu Trp Trp Gly Ala Met Asp Glu Ala Leu Gly Glu  
65 70 75 80

Ala Leu Pro Leu Thr Thr Pro Glu Leu Glu Cys Ser Pro Glu Gln Glu  
85 90 95

Ile Gly Ala Leu Leu Ile Leu Leu Asp Leu Gly Glu Tyr Glu Leu Val  
100 105 110

Val Lys Tyr Gly Glu Pro Val Leu His Asp Pro Asn Pro Pro Ala Gly  
115 120 125

Gly Leu Pro Gln Asp Tyr Leu Leu Ser Val Ile Leu Ala His Trp Glu  
130 135 140

Leu Ser Arg Glu Arg Trp Gln Gln Gln Tyr Glu Phe Ala Ala Thr  
145 150 155 160

Ala Ser Leu Lys Ala Leu Ala Arg Leu Gln Gln Asp Asn Asp Phe Pro  
165 170 175

Ala Leu Glu Ala Glu Ile Arg Gln Glu Leu Tyr Arg Leu Arg Pro Tyr  
180 185 190

Arg Ile Leu Glu Leu Leu Ala Lys Glu Gly Gln Gly Glu Glu Gln Arg  
195 200 205

Gln Gln Gly Leu Ala Leu Leu Gln Ala Met Val Gln Asp Arg Gly Gly  
210 215 220

Ile Glu Gly Lys Gly Glu Asp Tyr Ser Gly Leu Gly Asn Asp Asp Phe  
225 230 235 240

Leu Lys Phe Ile His Gln Leu Arg Cys His Leu Thr Val Ala Glu Gln  
245 250 255

Asn Ala Leu Phe Leu Pro Glu Ser Gln Arg Pro Ser Leu Val Ala Ser  
260 265 270

Tyr Leu Ala Val His Ser Leu Met Ala Glu Gly Val Lys Glu Gln Asp  
275 280 285

Pro Met Ala Ile Val Glu Ala Lys Ser Leu Ile Ile Gln Leu Glu Asn  
290 295 300

Cys Gln Asp Leu Ala Leu Glu Lys Val Ile Cys Glu Leu Leu Leu Gly  
305 310 315 320

Gln Thr Glu Val Val Leu Ala Ala Ile Asp Gln Gly Asp Pro Lys Ile  
325 330 335

Val Ala Gly Leu Glu Ser Lys Leu Ala Thr Gly Glu Asp Pro Leu Thr  
340 345 350

Ala Phe Tyr Thr Phe Thr Glu Gln Trp Leu Glu Glu Glu Ile Val Pro  
355 360 365

Tyr Phe Arg Asp Leu Ser Pro Glu Thr Leu Ser Pro Lys Ala Tyr Phe  
370 375 380

Asn Asn Pro Ser Val Gln Gln Tyr Leu Glu Gln Leu Glu Pro Asp Ser  
385 390 395 400

Phe Thr Thr Asp Asn Ser Phe Ala Ser Pro Ala Leu Leu Ser Thr Ala  
405 410 415

Thr Glu Ser Glu Thr Pro Met Val His Ser Ser Ala Ala Leu Pro Asp  
420 425 430

Arg Pro Leu Thr Ser Thr Val Pro Ser Arg Arg Gly Arg Ser Pro Arg  
435 440 445

Arg Ser Arg Asp Asp Val Phe Pro Ser Ala Asp Asn Ser Ser Gly Leu  
450 455 460

Ala Val Thr Thr Leu Ser Pro Ala Ile Ala Tyr Asp Thr His Ser Leu  
465 470 475 480

Gly Thr Asn Gly Ile Gly Gly Asp Ser Thr Ser Asn Gly Phe Ser Ser  
485 490 495

Asn Ser Ala Pro Glu Ser Thr Ser Lys His Lys Ser Pro Arg Arg Arg  
500 505 510

Lys Lys Arg Val Thr Ile Lys Pro Val Arg Phe Gly Ile Phe Leu Leu  
515 520 525

Cys Leu Ala Gly Ile Val Gly Gly Ala Thr Ala Leu Ile Ile Asn Arg  
530 535 540

Thr Gly Asp Pro Leu Gly Gly Leu Leu Glu Asp Pro Leu Asp Val Phe  
545 550 555 560

Leu Asp Gln Pro Ser Glu  
565

<210> 120  
<211> 573  
<212> PRT  
<213> Synechococcus PCC7002

<400> 120

Thr Val Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu Cys Val Pro Ala  
1 5 10 15

Lys Ala Thr Thr Ala Gln Ile Thr Gln Ala Tyr Arg Asp Arg Leu Ser  
20 25 30

Gln Phe Pro Arg Arg Glu His Asn Ala Leu Ala Ile Glu Ala Arg Asn  
35 40 45

Arg Ile Ile Glu Gln Ala Phe Glu Val Leu Ser Gln Thr Glu Thr Arg  
50 55 60

Ala Val Tyr Asp His Glu Leu Ser Gly Asn Met Phe Arg Ser Leu Val  
65 70 75 80

Pro Ser Arg Pro Lys Leu Pro Phe Pro Asp Arg Pro Ser Ser Asp Thr  
85 90 95

Glu Leu Glu Ala Leu Thr Ala His Gln Pro Thr Ile Asp Ile Ala Glu  
100 105 110

Lys Asp Leu Leu Gly Gly Leu Leu Leu Leu Asp Leu Gly Glu Tyr  
115 120 125

Glu Leu Val Leu Lys Trp Ala Ala Pro Tyr Leu Lys Gly Lys Gly Lys  
130 135 140

Leu Val Lys Glu Gly Lys Phe Gly Ala Val Glu Ile Val Glu Gln Glu  
145 150 155 160

Leu Arg Leu Cys Leu Ala Leu Ala His Trp Glu Leu Ser Arg Glu Gln  
165 170 175

Trp Leu Gln Gln His Tyr Glu Gln Ala Ala Leu Ser Gly Gln Lys Ser  
180 185 190

Gln Glu Leu Leu Val Asp Val Ala Gln Phe Ala Asp Leu Gln Gln Glu  
195 200 205

Ile Gln Gly Asp Leu Asn Arg Leu Arg Pro Tyr Gln Val Leu Glu Leu  
210 215 220

Leu Ala Leu Pro Glu Ser Glu Thr Gln Glu Arg Gln Arg Gly Leu Gln  
225 230 235 240

Leu Leu Gln Glu Met Leu Ser Ala Arg Val Gly Ile Asp Gly Gln Gly  
245 250 255

Asp Asp Gln Ser Gly Leu Ser Ile Asp Asp Phe Leu Arg Phe Ile Gln  
260 265 270

Gln Leu Arg Ser Tyr Leu Thr Val Gln Glu Gln Leu Asp Leu Phe Val  
275 280 285

Ala Glu Ser Lys Arg Pro Ser Ala Ala Ala Tyr Leu Ala Val Tyr  
290 295 300

Ala Leu Leu Ala Ala Gly Phe Ser Gln Arg Lys Pro Asp Leu Val Val  
305 310 315 320

Gln Ala Gln Thr Leu Leu Lys Arg Leu Gly Lys Arg Gln Asp Val Phe  
325 330 335

Leu Glu Gln Ser Ile Cys Ala Leu Leu Leu Gly Gln Pro Ser Glu Ala  
340 345 350

Asn Gln Leu Leu Glu Gln Ser Gln Glu Gln Glu Ala Ile Ala Tyr Ile  
355 360 365

Gln Glu Gln Ser Glu Gly Ala Pro Asp Leu Leu Pro Gly Leu Cys Leu  
370 375 380

Tyr Gly Glu Gln Trp Leu Lys Thr Glu Val Phe Ser His Phe Arg Asp  
385 390 395 400

Leu Arg Gln Arg Leu Glu Asp Gly Ser Val Ser Leu Thr Ala Tyr Phe  
405 410 415

Ala Asp Pro Glu Val Gln Gln Tyr Leu Asp Asp Leu Leu Thr Glu Ala  
420 425 430

Val Pro Thr Pro Thr Pro His Pro Asp Thr Glu Ser Thr Ala Ala Pro  
435 440 445

Ser Glu Lys Pro Pro Glu Thr Leu Gln Ser Glu Thr Gly Val Ser Pro  
450 455 460

His Pro Ser Arg Pro Ala Lys Val Asp Ser Phe Glu Asp Leu Val Thr  
465 470 475 480

Gln Thr Pro Ala Thr Val Pro Pro Ala Pro Pro Ser Pro Gly Val Ala  
485 490 495

Pro Val Thr Ala Ala Leu Asn Pro Asp Pro Glu Ala Ser Ser Ala Ser  
500 505 510

Ser Lys Ser Val Ser Ser Lys Lys Ser Ile Gly Pro Trp Gly Ala Ile  
515 520 525

Ala Ala Ile Val Gly Ser Val Leu Leu Val Val Gly Leu Val Arg Ile  
530 535 540

Leu Ser Gly Leu Thr Thr Gln Glu Pro Leu Gln Val Thr Leu Asn Gly  
545 550 555 560

Glu Pro Pro Leu Thr Ile Pro Ser Leu Asp Thr Ala Glu  
565 570

<210> 121  
<211> 515  
<212> PRT  
<213> Synechococcus WH8102

<400> 121

Gly Asp Leu Trp Thr Leu Asp Leu Pro Ile Asp His Phe Arg Leu Leu  
1 5 10 15

Gly Val Ser Pro Ser Ala Asp Pro Ala Ser Ile Leu Arg Arg Leu Gln  
20 25 30

Thr Arg Ser Asp Ser Pro Pro Asp Asp Gly Phe Thr His Glu Gly Leu  
35 40 45

Leu Gln Arg Gln Ala Leu Leu His Arg Ser Ala Asp Leu Leu Thr Asp  
50 55 60

Pro Ser Glu Arg Ala Asp Tyr Glu Ala Ala Leu Leu Ser Leu Ser Ala  
65 70 75 80

Thr His Pro Asn Glu Thr Val Gly Leu Asp Leu Ala Ala Ser Ser Glu  
85 90 95

Val Ala Gly Leu Ile Leu Leu Trp Glu Ala Gly Ala Ala Leu Glu Ala  
100 105 110

Phe Gln Leu Ala Arg Gln Gly Leu Gln Pro Pro Gln Ala Pro Ala Leu  
115 120 125

Gly Ser Gly Arg Glu Ala Asp Leu Thr Leu Leu Ala Ala Leu Ala Cys  
130 135 140

Arg Asp Ala Ala Arg Asp Glu Gln Gln Arg Arg Tyr Glu Ser Ala  
145 150 155 160

Ala Gln Leu Leu Arg Asp Gly Ile Glu Leu Gln Gln Arg Met Gly Lys  
165 170 175

Leu Pro Asp Gln Gln Ala Arg Leu Gln Gln Glu Leu Asp Asp Leu Leu  
180 185 190

Pro Tyr Arg Val Leu Asp Leu Leu Ser Arg Asp Leu Ser Asp Ala Asp  
195 200 205

Ala Arg Gln Gln Gly Ile Ser Leu Leu Asp Gln Leu Val Arg Asp Arg  
210 215 220

Gly Gly Leu Asp Pro Glu Gly Leu Asp Ser Glu Thr Pro Ala Ala Met  
225 230 235 240

Gly Gln Ala Asp Phe Glu Ser Phe Phe Gln Gln Ile Arg Arg Phe Leu  
245 250 255

Thr Val Gln Glu Gln Val Asp Leu Phe Arg Gly Trp Phe Ala Glu Gly  
260 265 270

Ser Ile Glu Ala Gly Cys Leu Ala Val Phe Ala Leu Ala Ala Ala Gly  
275 280 285

Tyr Ser Arg Arg Lys Pro Glu Phe Leu Glu Gln Ala Arg Glu Gln Leu  
290 295 300

Gln Arg Leu Val Ala Ser Asp Leu Asp Pro Met Pro Leu Leu Gly Cys  
305 310 315 320

Leu Asp Leu Leu Leu Gly Asn Val Ala Glu Ala Ser Leu His Phe Ser  
325 330 335

Ala Ile Arg Asp Glu Glu Leu Leu Ser Trp Leu Ala Glu His Pro Gly  
340 345 350

Asp His Leu Ala Ala Gln Cys Glu Tyr Cys Arg Val Trp Leu Glu Arg  
355 360 365

Asp Val Leu Pro Gly Tyr Arg Asp Val Asp Ala Ala Gly Val Asp Leu  
370 375 380

Asp Ala Trp Phe Ala Asp Arg Asp Val Gln Ala Tyr Val Asp Arg Ile  
385 390 395 400

Asp Arg Gln Ser Ala Arg Leu Gly Ser Ala Ala Thr Val Thr Gly Ala  
405 410 415

Gly Leu Ser Ser Ala Pro Ser Ala Asp Ala Ser Ser Pro His Glu Ala  
420 425 430

Ala Leu Asp Asp Asp His Leu Pro Ala Glu Glu Ala Pro Ser Ser Asp  
435 440 445

Pro Ala Asn Gln Arg Leu Ser Asn Arg Leu Arg Trp Leu Ala Ala Ser  
450 455 460

Leu Val Val Gly Leu Val Ala Ala Leu Ala Ala Ala Val Met Leu Arg  
465 470 475 480

Pro Arg Glu Thr Ala Pro Val Val Leu Gln Pro Glu Pro Asp Arg Gln  
485 490 495

Asp Ala Val Glu Pro Lys Pro Ser Ala Gln Asp Ser Ala Thr Leu Lys  
500 505 510

Pro Gln Ala  
515

<210> 122  
<211> 525  
<212> PRT  
<213> Oryza sativa

<400> 122

Ala Ala Glu Arg Ser Leu Pro Leu Gln Val Asp Phe Tyr Lys Val Leu  
1 5 10 15

Gly Ala Glu Pro His Phe Leu Gly Asp Gly Ile Arg Arg Ala Phe Glu  
20 25 30

Ala Arg Ile Ala Lys Pro Pro Gln Tyr Gly Tyr Ser Thr Asp Ala Leu  
35 40 45

Val Gly Arg Arg Gln Met Leu Gln Ile Ala His Asp Thr Leu Met Asn  
50 55 60

Gln Asn Ser Arg Thr Gln Tyr Asp Arg Ala Leu Ser Glu Asn Arg Glu  
65 70 75 80

Glu Ala Leu Thr Met Asp Ile Ala Trp Asp Lys Glu Ala Gly Glu Ala  
85 90 95

Leu Ala Val Leu Val Thr Gly Glu Gln Leu Leu Leu Asp Arg Pro Pro  
100 105 110

Lys Arg Phe Lys Gln Asp Val Val Leu Ala Met Ala Leu Ala Tyr Val  
115 120 125

Asp Leu Ser Arg Asp Ala Met Ala Ala Ser Pro Pro Asp Val Ile Gly  
130 135 140

Cys Cys Glu Val Leu Glu Arg Ala Leu Lys Leu Leu Gln Glu Asp Gly  
145 150 155 160

Ala Ser Asn Leu Ala Pro Asp Leu Leu Ser Gln Ile Asp Glu Thr Leu  
165 170 175

Glu Glu Ile Thr Pro Arg Cys Val Leu Glu Leu Leu Ser Leu Pro Ile  
180 185 190

Asp Thr Glu His His Lys Lys Arg Gln Glu Gly Leu Gln Gly Ala Arg  
195 200 205

Asn Ile Leu Trp Ser Val Gly Arg Gly Gly Ile Ala Thr Val Gly Gly  
210 215 220

Gly Phe Ser Arg Glu Ala Phe Met Asn Glu Ala Phe Leu Arg Met Thr  
225 230 235 240

Ser Ile Glu Gln Met Asp Phe Phe Ser Lys Thr Pro Asn Ser Ile Pro  
245 250 255

Pro Glu Trp Phe Glu Ile Tyr Asn Val Ala Leu Ala His Val Ala Gln  
260 265 270

Ala Ile Ile Ser Lys Arg Pro Gln Phe Ile Met Met Ala Asp Asp Leu  
275 280 285

Phe Glu Gln Leu Gln Lys Phe Asn Ile Gly Ser His Tyr Ala Tyr Asp  
290 295 300

Asn Glu Met Asp Leu Ala Leu Glu Arg Ala Phe Cys Ser Leu Leu Val  
305 310 315 320

Gly Asp Val Ser Lys Cys Arg Met Trp Leu Gly Ile Asp Asn Glu Ser  
325 330 335

Ser Pro Tyr Arg Asp Pro Lys Ile Leu Glu Phe Ile Val Thr Asn Ser  
340 345 350

Ser Ile Ser Glu Glu Asn Asp Leu Leu Pro Gly Leu Cys Lys Leu Leu  
355 360 365

Glu Thr Trp Leu Ile Phe Glu Val Phe Pro Arg Ser Arg Asp Thr Arg  
370 375 380

Gly Met Gln Phe Arg Leu Gly Asp Tyr Tyr Asp Asp Pro Glu Val Leu  
385 390 395 400

Ser Tyr Leu Glu Arg Met Glu Gly Gly Ala Ser His Leu Ala Ala  
405 410 415

Ala Ala Ala Ile Ala Lys Leu Gly Ala Gln Ala Thr Ala Ala Leu Gly  
420 425 430

Thr Val Lys Ser Asn Ala Ile Gln Ala Phe Asn Lys Val Phe Pro Leu  
435 440 445

Ile Glu Gln Leu Asp Arg Ser Ala Met Glu Asn Thr Lys Asp Gly Pro  
450 455 460

Gly Gly Tyr Leu Glu Asn Phe Asp Gln Glu Asn Ala Pro Ala His Asp  
465 470 475 480

Ser Arg Asn Ala Ala Leu Lys Ile Ile Ser Ala Gly Ala Leu Phe Ala  
485 490 495

Leu Leu Ala Val Ile Gly Ala Lys Tyr Leu Pro Arg Lys Arg Pro Leu  
500 505 510

Ser Ala Ile Arg Ser Glu His Gly Ser Val Ala Val Ala  
515 520 525

<211> 578  
<212> PRT  
<213> Arabidopsis thaliana

<400> 123

Arg Pro Glu Arg His Val Pro Ile Pro Ile Asp Phe Tyr Gln Val Leu  
1 5 10 15

Gly Ala Gln Thr His Phe Leu Thr Asp Gly Ile Arg Arg Ala Phe Glu  
20 25 30

Ala Arg Val Ser Lys Pro Pro Gln Phe Gly Phe Ser Asp Asp Ala Leu  
35 40 45

Ile Ser Arg Arg Gln Ile Leu Gln Ala Ala Cys Glu Thr Leu Ser Asn  
50 55 60

Pro Arg Ser Arg Arg Glu Tyr Asn Glu Gly Leu Leu Asp Asp Glu Glu  
65 70 75 80

Ala Thr Val Ile Thr Asp Val Pro Trp Asp Lys Val Pro Gly Ala Leu  
85 90 95

Cys Val Leu Gln Glu Gly Glu Thr Glu Ile Val Leu Arg Val Gly  
100 105 110

Glu Ala Leu Leu Lys Glu Arg Leu Pro Lys Ser Phe Lys Gln Asp Val  
115 120 125

Val Leu Val Met Ala Leu Ala Phe Leu Asp Val Ser Arg Asp Ala Met  
130 135 140

Ala Leu Asp Pro Pro Asp Phe Ile Thr Gly Tyr Glu Phe Val Glu Glu  
145 150 155 160

Ala Leu Lys Leu Leu Gln Glu Glu Gly Ala Ser Ser Leu Ala Pro Asp  
165 170 175

Leu Arg Ala Gln Ile Asp Glu Thr Leu Glu Glu Ile Thr Pro Arg Tyr  
180 185 190

Val Leu Glu Leu Leu Gly Leu Pro Leu Gly Asp Asp Tyr Ala Ala Lys  
195 200 205

Arg Leu Asn Gly Leu Ser Gly Val Arg Asn Ile Leu Trp Ser Val Gly  
210 215 220

Gly Gly Gly Ala Ser Ala Leu Val Gly Gly Leu Thr Arg Glu Lys Phe  
225 230 235 240

Met Asn Glu Ala Phe Leu Arg Met Thr Ala Ala Glu Gln Val Asp Leu  
245 250 255

Phe Val Ala Thr Pro Ser Asn Ile Pro Ala Glu Ser Phe Glu Val Tyr  
260 265 270

Glu Val Ala Leu Ala Leu Val Ala Gln Ala Phe Ile Gly Lys Lys Pro  
275 280 285

His Leu Leu Gln Asp Ala Asp Lys Gln Phe Gln Gln Leu Gln Gln Ala  
290 295 300

Lys Val Met Ala Met Glu Ile Pro Ala Met Leu Tyr Asp Thr Arg Asn  
305 310 315 320

Asn Trp Glu Ile Asp Phe Gly Leu Glu Arg Gly Leu Cys Ala Leu Leu  
325 330 335

Ile Gly Lys Val Asp Glu Cys Arg Met Trp Leu Gly Leu Asp Ser Glu  
340 345 350

Asp Ser Gln Tyr Arg Asn Pro Ala Ile Val Glu Phe Val Leu Glu Asn  
355 360 365

Ser Asn Arg Asp Asp Asn Asp Asp Leu Pro Gly Leu Cys Lys Leu Leu  
370 375 380

Glu Thr Trp Leu Ala Gly Val Val Phe Pro Arg Phe Arg Asp Thr Lys  
385 390 395 400

Asp Lys Lys Phe Lys Leu Gly Asp Tyr Tyr Asp Asp Pro Met Val Leu  
405 410 415

Ser Tyr Leu Glu Arg Val Glu Val Val Gln Gly Ser Pro Leu Ala Ala  
420 425 430

Ala Ala Ala Met Ala Arg Ile Gly Ala Glu His Val Lys Ala Ser Ala  
435 440 445

Met Gln Ala Leu Gln Lys Val Phe Pro Ser Arg Tyr Thr Asp Arg Asn  
450 455 460

Ser Ala Glu Pro Lys Asp Val Gln Glu Thr Val Phe Ser Val Asp Pro  
465 470 475 480

Val Gly Asn Asn Val Gly Arg Asp Gly Glu Pro Gly Val Phe Ile Ala  
485 490 495

Glu Ala Val Arg Pro Ser Glu Asn Phe Glu Thr Asn Asp Tyr Ala Ile  
500 505 510

Arg Ala Gly Val Ser Glu Ser Ser Val Asp Glu Thr Thr Val Glu Met  
515 520 525

Ser Val Ala Asp Met Leu Lys Glu Ala Ser Val Lys Ile Leu Ala Ala  
530 535 540

Gly Val Ala Ile Gly Leu Ile Ser Leu Phe Ser Gln Lys Tyr Phe Leu  
545 550 555 560

Lys Ser Ser Ser Ser Phe Gln Arg Lys Asp Met Val Ser Ser Met Glu  
565 570 575

Ser Asp

<210> 124

<211> 99

<212> PRT

<213> Solanum tuberosum

<400> 124

Pro Ser Asp His His Ile Ser Met Pro Ile Asp Phe Tyr Arg Val Leu  
1 5 10 15

Gly Ala Glu Ala His Phe Leu Gly Asp Gly Ile Arg Arg Cys Tyr Asp  
20 25 30

Ala Arg Ile Thr Lys Pro Pro Gln Tyr Gly Tyr Ser Gln Glu Ala Leu  
35 40 45

Ile Gly Arg Arg Gln Ile Leu Gln Ala Ala Cys Glu Thr Leu Ala Asp  
50 55 60

Ser Thr Ser Arg Arg Glu Tyr Asn Gln Gly Leu Ala Gln His Glu Phe  
65 70 75 80

Asp Thr Ile Leu Thr Pro Val Pro Trp Asp Lys Val Pro Gly Ala Met  
85 90 95

Cys Val Leu

<210> 125  
<211> 760  
<212> PRT  
<213> Oryza sativa

<400> 125

Met Glu Gly Phe His Asn Leu Leu Ala Arg Pro Asn Ser Ala Pro Phe  
1 5 10 15

Ala Phe Ser Leu Pro Arg Pro Arg Pro Arg Arg Arg Pro Pro  
20 25 30

Pro His Pro Ser Ala Ala Cys Arg Ala Ala Ser Arg Trp Ala Glu Arg  
35 40 45

Leu Phe Ala Asp Phe His Leu Leu Pro Thr Ala Ala Pro Ser Asp Pro  
50 55 60

Pro Ser Pro Ala Pro Ala Pro Ala Ala Pro Ser Ala Ser Pro Phe  
65 70 75 80

Val Pro Leu Phe Pro Asp Ala Ala Glu Arg Ser Leu Pro Leu Gln Val  
85 90 95

Asp Phe Tyr Lys Val Leu Gly Ala Glu Pro His Phe Leu Gly Asp Gly  
100 105 110

Ile Arg Arg Ala Phe Glu Ala Arg Ile Ala Lys Pro Pro Gln Tyr Gly  
115 120 125

Tyr Ser Thr Asp Ala Leu Val Gly Arg Arg Gln Met Leu Gln Ile Ala  
130 135 140

His Asp Thr Leu Met Asn Gln Asn Ser Arg Thr Gln Tyr Asp Arg Ala  
145 150 155 160

Leu Ser Glu Asn Arg Glu Glu Ala Leu Thr Met Asp Ile Ala Trp Asp  
165 170 175

Lys Glu Ala Gly Glu Ala Leu Ala Val Leu Val Thr Gly Glu Gln Leu  
180 185 190

Leu Leu Asp Arg Pro Pro Lys Arg Phe Lys Gln Asp Val Val Leu Ala  
195 200 205

Met Ala Leu Ala Tyr Val Asp Leu Ser Arg Asp Ala Met Ala Ala Ser  
210 215 220

Pro Pro Asp Val Ile Gly Cys Cys Glu Val Leu Glu Arg Ala Leu Lys  
225 230 235 240

Leu Leu Gln Glu Asp Gly Ala Ser Asn Leu Ala Pro Asp Leu Leu Ser  
245 250 255

Gln Ile Asp Glu Thr Leu Glu Glu Ile Thr Pro Arg Cys Val Leu Glu  
260 265 270

Leu Leu Ser Leu Pro Ile Asp Thr Glu His His Lys Lys Arg Gln Glu  
275 280 285

Gly Leu Gln Gly Ala Arg Asn Ile Leu Trp Ser Val Gly Arg Gly Gly  
290 295 300

Ile Ala Thr Val Gly Gly Phe Ser Arg Glu Ala Phe Met Asn Glu  
305 310 315 320

Ala Phe Leu Arg Met Thr Ser Ile Glu Gln Met Asp Phe Phe Ser Lys  
325 330 335

Thr Pro Asn Ser Ile Pro Pro Glu Trp Phe Glu Ile Tyr Asn Val Ala  
340 345 350

Leu Ala His Val Ala Gln Ala Ile Ile Ser Lys Arg Pro Gln Phe Ile  
355 360 365

Met Met Ala Asp Asp Leu Phe Glu Gln Leu Gln Lys Phe Asn Ile Gly  
370 375 380

Ser His Tyr Ala Tyr Asp Asn Glu Met Asp Leu Ala Leu Glu Arg Ala  
385 390 395 400

Phe Cys Ser Leu Leu Val Gly Asp Val Ser Lys Cys Arg Met Trp Leu  
405 410 415

Gly Ile Asp Asn Glu Ser Ser Pro Tyr Arg Asp Pro Lys Ile Leu Glu  
420 425 430

Phe Ile Val Thr Asn Ser Ser Ile Ser Glu Glu Asn Asp Leu Leu Pro  
435 440 445

Gly Leu Cys Lys Leu Leu Glu Thr Trp Leu Ile Phe Glu Val Phe Pro  
450 455 460

Arg Ser Arg Asp Thr Arg Gly Met Gln Phe Arg Leu Gly Asp Tyr Tyr  
465 470 475 480

Asp Asp Pro Glu Val Leu Ser Tyr Leu Glu Arg Met Glu Gly Gly  
485 490 495

Ala Ser His Leu Ala Ala Ala Ala Ile Ala Lys Leu Gly Ala Gln  
500 505 510

Ala Thr Ala Ala Leu Gly Thr Val Lys Ser Asn Ala Ile Gln Ala Phe  
515 520 525

Asn Lys Val Phe Pro Leu Ile Glu Gln Leu Asp Arg Ser Ala Met Glu  
530 535 540

Asn Thr Lys Asp Gly Pro Gly Gly Tyr Leu Glu Asn Phe Asp Gln Glu  
545 550 555 560

Asn Ala Pro Ala His Asp Ser Arg Asn Ala Ala Leu Lys Ile Ile Ser  
565 570 575

Ala Gly Ala Leu Phe Ala Leu Leu Ala Val Ile Gly Ala Lys Tyr Leu  
580 585 590

Pro Arg Lys Arg Pro Leu Ser Ala Ile Arg Ser Glu His Gly Ser Val  
595 600 605

Ala Val Ala Asn Ser Val Asp Ser Thr Asp Asp Pro Ala Leu Asp Glu  
610 615 620

Asp Pro Val His Ile Pro Arg Met Asp Ala Lys Leu Ala Glu Asp Ile  
625 630 635 640

Val Arg Lys Trp Gln Ser Ile Lys Ser Lys Ala Leu Gly Pro Glu His  
645 650 655

Ser Val Ala Ser Leu Gln Glu Val Leu Asp Gly Asn Met Leu Lys Val  
660 665 670

Trp Thr Asp Arg Ala Ala Glu Ile Glu Arg His Gly Trp Phe Trp Glu  
675 680 685

Tyr Thr Leu Ser Asp Val Thr Ile Asp Ser Ile Thr Ile Ser Leu Asp  
690 695 700

Gly Arg Arg Ala Thr Val Glu Ala Thr Ile Asp Glu Ala Gly Gln Leu  
705 710 715 720

Thr Asp Val Thr Glu Pro Arg Asn Asn Asp Ser Tyr Asp Thr Lys Tyr  
725 730 735

Thr Thr Arg Tyr Glu Met Ala Phe Ser Lys Leu Gly Gly Trp Lys Ile  
740 745 750

Thr Glu Gly Ala Val Leu Lys Ser  
755 760

<210> 126  
<211> 2283  
<212> DNA  
<213> Oryza sativa

<400> 126  
atggagggct tccacaaacct cctcgccccgc cccaaactcggt cgccattcgct cttctccctc 60  
cctcgccccgc gccccgcggcc gcggccgcagg ccggccgcctc accccctccgc tgcctgcccgc 120  
gccgcgagcc gctggggccga acgcctcttc gccgacttcc acctcctccccc caccggcgcg 180  
ccctccgacc cgccgtcccc ggccccggcc ccggccgcgg cgccctccgc ctcccccttc 240  
gtcccgctct tccccgacgc cgccgaacgc tccctccgc tccaagtcga tttctacaag 300  
gttcttagggg cagagccaca tttccttggc gatggcatca ggagggcggt cgaggcacgg 360  
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ctgcagattt cccatgacac tctcatgaac cagaactccc gcactcagta tgatcgtgcg 480

ctttctgaga accgtgaaga agctctcacc atggatattg cttggaccaa ggaggctggg	540
gaggcacttg ctgtgcttgt aactggagaa cagttgcttc tggatcggcc acccaagcgc	600
ttcaagcagg acgtgggtgc agcgatggct ctggcttatg tggatctatc aaggatgct	660
atggcagcaa gccctccaga tgtaattggc tgctgcgagg tgctcgagag ggctctcaag	720
ctcttcagg aagatggagc aagcaatctc gcacctgatc tgcttcaca gattgatgaa	780
actctcgagg agattacacc tcgctgtgtt ttggagcttc tctcccttcc tattgacaca	840
gagcatcata agaagcgcca agaaggcctt caaggtgcga gaaacatttt gtggagcggtt	900
ggcagaggag gtattgctac cggtggagga ggattttctc gtgaagcctt catgaacgag	960
gctttttga ggatgacatc aattgaacag atggatttct ttcaaaaaac accgaatagc	1020
attcctcctg aatggtttga aatttacaat gtagcacttg cacatgtcgc tcaagcaatt	1080
ataagtaaaa ggccacaatt catcatgatg gcggatgatc ttttgaaca actccagaag	1140
ttcaacatag gttctcattha tgcttatgtt aatgagatgg accttgcatt ggaaagggca	1200
ttctgctcat tgctagtcgg agatgttagc aagtgcagaa tgtggcttgg aattgataat	1260
gagtcttcac catacagaga ccccaaaattt ctagagtttta ttgtgaccaa ctctagcatc	1320
agtgaagaga atgatcttct tccagggctg tgcaagctt tggagacttg gcttatctt	1380
gaggttttcctt ctaggagcag agatactcgg ggcatgcagt tcagacttgg agattactac	1440
gatgatccag aagtttaag ctacctagaa agatggagg gtgggtggc ttctcatttg	1500
gctgctgctg ctgctattgc aaaacttggt gctcaagcta cagctgcact tggtaactgt	1560
aaatcaaatg ctattcaagc gttcaacaag gttttccat tgatagaaca gttagacagg	1620
tcagccatgg aaaatactaa agatggccct gggggatatc ttgaaaattt tgaccaggaa	1680
aatgcacctg ctcatgattc gagaatgcc gccttgaaga ttatctctgc tggcgcactg	1740
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gcactagatg aagatccagt acatattcct agaatggatg cgaagctggc agaagatatt	1920
gttcgcaagt ggcagagttt caaatctaag gccttggac cagaacattc gggtgcata	1980
ttgcaagagg ttcttgcattt caacatgcta aaggtgttggc ctgaccgagc agcggagatt	2040
gagcgtcatg ggtggttctg ggagtataca ctatccatgt tgacgatttga tagcatca	2100
atctccctag atggtcgacg agcgactgtg gaggctacga ttgtatgagggc aggccaactt	2160

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gagatggcct	tctccaagct	aggagggtgg	aagataacgg	aaggagcagt	cctcaagtcg	2280										
tag						2283										
<210> 127																
<211> 801																
<212> PRT																
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Ser	Thr	Thr	Ile	Cys	Ser	Ala	Ser	Lys	Trp	Ala	Asp	Arg	Leu	Leu	Ser	2283
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Thr	Thr	Thr	Ala	Thr	Leu	Val	Ser	Pro	Pro	Pro	Ser	Ile	Asp	Arg	Pro	
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Gln	Thr	His	Phe	Leu	Thr	Asp	Gly	Ile	Arg	Arg	Ala	Phe	Glu	Ala	Arg	
						100			105						110	
Val	Ser	Lys	Pro	Pro	Gln	Phe	Gly	Phe	Ser	Asp	Asp	Ala	Leu	Ile	Ser	
						115			120						125	
Arg	Arg	Gln	Ile	Leu	Gln	Ala	Ala	Cys	Glu	Thr	Leu	Ser	Asn	Pro	Arg	
						130			135						140	
Ser	Arg	Arg	Glu	Tyr	Asn	Glu	Gly	Leu	Leu	Asp	Asp	Glu	Glu	Ala	Thr	
						145			150						160	
Val	Ile	Thr	Asp	Val	Pro	Trp	Asp	Lys	Val	Pro	Gly	Ala	Leu	Cys	Val	
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Leu Gln Glu Gly Gly Glu Thr Glu Ile Val Leu Arg Val Gly Glu Ala  
180 185 190

Leu Leu Lys Glu Arg Leu Pro Lys Ser Phe Lys Gln Asp Val Val Leu  
195 200 205

Val Met Ala Leu Ala Phe Leu Asp Val Ser Arg Asp Ala Met Ala Leu  
210 215 220

Asp Pro Pro Asp Phe Ile Thr Gly Tyr Glu Phe Val Glu Glu Ala Leu  
225 230 235 240

Lys Leu Leu Gln Glu Glu Gly Ala Ser Ser Leu Ala Pro Asp Leu Arg  
245 250 255

Ala Gln Ile Asp Glu Thr Leu Glu Glu Ile Thr Pro Arg Tyr Val Leu  
260 265 270

Glu Leu Leu Gly Leu Pro Leu Gly Asp Asp Tyr Ala Ala Lys Arg Leu  
275 280 285

Asn Gly Leu Ser Gly Val Arg Asn Ile Leu Trp Ser Val Gly Gly Gly  
290 295 300

Gly Ala Ser Ala Leu Val Gly Gly Leu Thr Arg Glu Lys Phe Met Asn  
305 310 315 320

Glu Ala Phe Leu Arg Met Thr Ala Ala Glu Gln Val Asp Leu Phe Val  
325 330 335

Ala Thr Pro Ser Asn Ile Pro Ala Glu Ser Phe Glu Val Tyr Glu Val  
340 345 350

Ala Leu Ala Leu Val Ala Gln Ala Phe Ile Gly Lys Lys Pro His Leu  
355 360 365

Leu Gln Asp Ala Asp Lys Gln Phe Gln Gln Leu Gln Gln Ala Lys Val  
370 375 380

Met Ala Met Glu Ile Pro Ala Met Leu Tyr Asp Thr Arg Asn Asn Trp  
385 390 395 400

Glu Ile Asp Phe Gly Leu Glu Arg Gly Leu Cys Ala Leu Leu Ile Gly  
405 410 415

Lys Val Asp Glu Cys Arg Met Trp Leu Gly Leu Asp Ser Glu Asp Ser  
420 425 430

Gln Tyr Arg Asn Pro Ala Ile Val Glu Phe Val Leu Glu Asn Ser Asn  
435 440 445

Arg Asp Asp Asn Asp Asp Leu Pro Gly Leu Cys Lys Leu Leu Glu Thr  
450 455 460

Trp Leu Ala Gly Val Val Phe Pro Arg Phe Arg Asp Thr Lys Asp Lys  
465 470 475 480

Lys Phe Lys Leu Gly Asp Tyr Tyr Asp Asp Pro Met Val Leu Ser Tyr  
485 490 495

Leu Glu Arg Val Glu Val Val Gln Gly Ser Pro Leu Ala Ala Ala Ala  
500 505 510

Ala Met Ala Arg Ile Gly Ala Glu His Val Lys Ala Ser Ala Met Gln  
515 520 525

Ala Leu Gln Lys Val Phe Pro Ser Arg Tyr Thr Asp Arg Asn Ser Ala  
530 535 540

Glu Pro Lys Asp Val Gln Glu Thr Val Phe Ser Val Asp Pro Val Gly  
545 550 555 560

Asn Asn Val Gly Arg Asp Gly Glu Pro Gly Val Phe Ile Ala Glu Ala  
565 570 575

Val Arg Pro Ser Glu Asn Phe Glu Thr Asn Asp Tyr Ala Ile Arg Ala  
580 585 590

Gly Val Ser Glu Ser Ser Val Asp Glu Thr Thr Val Glu Met Ser Val  
595 600 605

Ala Asp Met Leu Lys Glu Ala Ser Val Lys Ile Leu Ala Ala Gly Val  
610 615 620

Ala Ile Gly Leu Ile Ser Leu Phe Ser Gln Lys Tyr Phe Leu Lys Ser  
625 630 635 640

Ser Ser Ser Phe Gln Arg Lys Asp Met Val Ser Ser Met Glu Ser Asp  
645 650 655

Val Ala Thr Ile Gly Ser Val Arg Ala Asp Asp Ser Glu Ala Leu Pro  
660 665 670

Arg Met Asp Ala Arg Thr Ala Glu Asn Ile Val Ser Lys Trp Gln Lys  
675 680 685

Ile Lys Ser Leu Ala Phe Gly Pro Asp His Arg Ile Glu Met Leu Pro  
690 695 700

Glu Val Leu Asp Gly Arg Met Leu Lys Ile Trp Thr Asp Arg Ala Ala  
705 710 715 720

Glu Thr Ala Gln Leu Gly Leu Val Tyr Asp Tyr Thr Leu Leu Lys Leu  
725 730 735

Ser Val Asp Ser Val Thr Val Ser Ala Asp Gly Thr Arg Ala Leu Val  
740 745 750

Glu Ala Thr Leu Glu Glu Ser Ala Cys Leu Ser Asp Leu Val His Pro  
755 760 765

Glu Asn Asn Ala Thr Asp Val Arg Thr Tyr Thr Thr Arg Tyr Glu Val  
770 775 780

Phe Trp Ser Lys Ser Gly Trp Lys Ile Thr Glu Gly Ser Val Leu Ala  
785 790 795 800

Ser

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<213> *Arabidopsis thaliana*

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aaatgggccc accgtcttct ctccgacttc aatttcaccc ctgattccctc ctccctcc 180  
ttcgccaccg ccaccaccac cgccactctc gtctctccgc caccatctat tgatcgcccc 240

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gaaatgttac cagaggtttt ggatgggcga atgctgaaga tttggactga cagagcagct 2160  
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gtgacagtct cagcagatgg aaccgtgct ctggtggaaag caactctgga ggagtctgct 2280  
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<211> 801  
<212> PRT  
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Ser Thr Thr Ile Cys Ser Ala Ser Lys Trp Ala Asp Arg Leu Leu Ser  
35 40 45

Asp Phe Asn Phe Thr Ser Asp Ser Ser Ser Phe Ala Thr Ala  
50 55 60

Thr Thr Thr Ala Thr Leu Val Ser Pro Pro Pro Ser Ile Asp Arg Pro  
65 70 75 80

Glu Arg His Val Pro Ile Pro Ile Asp Phe Tyr Gln Val Leu Gly Ala  
85 90 95

Gln Thr His Phe Leu Thr Asp Gly Ile Arg Arg Ala Phe Glu Ala Arg  
100 105 110

Val Ser Lys Pro Pro Gln Phe Gly Phe Ser Asp Asp Ala Leu Ile Ser  
115 120 125

Arg Arg Gln Ile Leu Gln Ala Ala Cys Glu Thr Leu Ser Asn Pro Arg  
130 135 140

Ser Arg Arg Glu Tyr Asn Glu Gly Leu Leu Asp Asp Glu Glu Ala Thr  
145 150 155 160

Val Ile Thr Asp Val Pro Trp Asp Lys Val Pro Gly Ala Leu Cys Val  
165 170 175

Leu Gln Glu Gly Gly Glu Thr Glu Ile Val Leu Arg Val Gly Glu Ala  
180 185 190

Leu Leu Lys Glu Arg Leu Pro Lys Ser Phe Lys Gln Asp Val Val Leu  
195 200 205

Val Met Ala Leu Ala Phe Leu Asp Val Ser Arg Asp Ala Met Ala Leu  
210 215 220

Asp Pro Pro Asp Phe Ile Thr Gly Tyr Glu Phe Val Glu Glu Ala Leu  
225 230 235 240

Lys Leu Leu Gln Glu Glu Gly Ala Ser Ser Leu Ala Pro Asp Leu Arg  
245 250 255

Ala Gln Ile Asp Glu Thr Leu Glu Glu Ile Thr Pro Arg Tyr Val Leu  
260 265 270

Glu Leu Leu Gly Leu Pro Leu Gly Asp Asp Tyr Ala Ala Lys Arg Leu  
275 280 285

Asn Gly Leu Ser Gly Val Arg Asn Ile Leu Trp Ser Val Gly Gly Gly  
290 295 300

Gly Ala Ser Ala Leu Val Gly Gly Leu Thr Arg Glu Lys Phe Met Asn  
305 310 315 320

Glu Ala Phe Leu Arg Met Thr Ala Ala Glu Gln Val Asp Leu Phe Val  
325 330 335

Ala Thr Pro Ser Asn Ile Pro Ala Glu Ser Phe Glu Val Tyr Glu Val  
340 345 350

Ala Leu Ala Leu Val Ala Gln Ala Phe Ile Gly Lys Lys Pro His Leu  
355 360 365

Leu Gln Asp Ala Asp Lys Gln Phe Gln Gln Leu Gln Gln Ala Lys Val  
370 375 380

Met Ala Met Glu Ile Pro Ala Met Leu Tyr Asp Thr Arg Asn Asn Trp  
385 390 395 400

Glu Ile Asp Phe Gly Leu Glu Arg Gly Leu Cys Ala Leu Leu Ile Gly  
405 410 415

Lys Val Asp Glu Cys Arg Met Trp Leu Gly Leu Asp Ser Glu Asp Ser  
420 425 430

Gln Tyr Arg Asn Pro Ala Ile Val Glu Phe Val Leu Glu Asn Ser Asn  
435 440 445

Arg Asp Asp Asn Asp Asp Leu Pro Gly Leu Cys Lys Leu Leu Glu Thr  
450 455 460

Trp Leu Ala Gly Val Val Phe Pro Arg Phe Arg Asp Thr Lys Asp Lys  
465 470 475 480

Lys Phe Lys Leu Gly Asp Tyr Tyr Asp Asp Pro Met Val Leu Ser Tyr  
485 490 495

Leu Glu Arg Val Glu Val Val Gln Gly Ser Pro Leu Ala Ala Ala  
500 505 510

Ala Met Ala Arg Ile Gly Ala Glu His Val Lys Ala Ser Ala Met Gln  
515 520 525

Ala Leu Gln Lys Val Phe Pro Ser Arg Tyr Thr Asp Arg Asn Ser Ala  
530 535 540

Glu Pro Lys Asp Val Gln Glu Thr Val Phe Ser Val Asp Pro Val Gly  
545 550 555 560

Asn Asn Val Gly Arg Asp Gly Glu Pro Gly Val Phe Ile Ala Glu Ala  
565 570 575

Val Arg Pro Ser Glu Asn Phe Glu Thr Asn Asp Tyr Ala Ile Arg Ala  
580 585 590

Gly Val Ser Glu Ser Ser Val Asp Glu Thr Thr Val Glu Met Ser Val  
595 600 605

Ala Asp Met Leu Lys Glu Ala Ser Val Lys Ile Leu Ala Ala Gly Val  
610 615 620

Ala Ile Gly Leu Ile Ser Leu Phe Ser Gln Lys Tyr Phe Leu Lys Ser  
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Ser Ser Ser Phe Gln Arg Lys Asp Met Val Ser Ser Met Glu Ser Asp  
645 650 655

Val Ala Thr Ile Gly Ser Val Arg Ala Asp Asp Ser Glu Ala Leu Pro  
660 665 670

Arg Met Asp Ala Arg Thr Ala Glu Asn Ile Val Ser Lys Trp Gln Lys  
675 680 685

Ile Lys Ser Leu Ala Phe Gly Pro Asp His Arg Ile Glu Met Leu Pro  
690 695 700

Glu Val Leu Asp Gly Arg Met Leu Lys Ile Trp Thr Asp Arg Ala Ala  
705 710 715 720

Glu Thr Ala Gln Leu Gly Leu Val Tyr Asp Tyr Thr Leu Leu Lys Leu  
725 730 735

Ser Val Asp Ser Val Thr Val Ser Ala Asp Gly Thr Arg Ala Leu Val  
740 745 750

Glu Ala Thr Leu Glu Glu Ser Ala Cys Leu Ser Asp Leu Val His Pro  
755 760 765

Glu Asn Asn Ala Thr Asp Val Arg Thr Tyr Thr Thr Arg Tyr Glu Val  
770 775 780

Phe Trp Ser Lys Ser Gly Trp Lys Ile Thr Glu Gly Ser Val Leu Ala  
785 790 795 800

Ser

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<211> 2637  
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<213> *Arabidopsis thaliana*

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ct	ctgagt	ca	cgtcgccatt	ggtctctccc	cattccaatt	atgcccatta	ccaccggcga	180
cg	acaaag	ct	ccgacgtac	cacaacacct	ctacaactat	ctgctccgccc	agcaaatggg	240
cc	gaccgt	tct	tccgac	ttcaattca	cctccgattc	ctccctctcc	tccttcgcca	300
cc	gcccacc	cac	ccact	ctcgctctc	cgccaccatc	tattgatcgt	cccgaacgcc	360
ac	gtccccat	ccccattgat	ttctaccagg	tattaggagc	tcaaacacat	ttcttaaccg		420
at	ggaatcag	aagagcat	tc	gaagctaggg	tttcgaaacc	gccgcaattc	ggtttcagcg	480
ac	gacgctt	aatc	agccgg	agacagattc	ttcaagctgc	ttgcgaaact	ctgtctaattc	540
ct	cggtctag	aagag	gtac	aatgaaggc	ttcttgatga	tgaagaagct	acagtcatca	600
ct	gatgttcc	tt	ggataag	gttcctgg	ctctctgtgt	attgcaagaa	ggtggtgaga	660
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gag	gtggagc	at	cgctt	tttt	ttttgg	ttttgtt	ttttgtt	1080
tttt	acag	ctg	ttttgtt	ttttgtt	ttttgtt	ttttgtt	ttttgtt	1140
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Ser Thr Thr Ile Cys Ser Ala Ser Lys Trp Ala Asp Arg Leu Leu Ser  
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Asp Phe Asn Phe Thr Ser Asp Ser Ser Ser Ser Phe Ala Thr Ala  
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Thr Thr Thr Ala Thr Leu Val Ser Pro Pro Pro Ser Ile Asp Arg Pro  
 65                   70                   75                   80

Glu Arg His Val Pro Ile Pro Ile Asp Phe Tyr Gln Val Leu Gly Ala  
85 90 95

Gln Thr His Phe Leu Thr Asp Gly Ile Arg Arg Ala Phe Glu Ala Arg  
100 105 110

Val Ser Lys Pro Pro Gln Phe Gly Phe Ser Asp Asp Ala Leu Ile Ser  
115 120 125

Arg Arg Gln Ile Leu Gln Ala Ala Cys Glu Thr Leu Ser Asn Pro Arg  
130 135 140

Ser Arg Arg Glu Tyr Asn Glu Gly Leu Leu Asp Asp Glu Glu Ala Thr  
145 150 155 160

Val Ile Thr Asp Val Pro Trp Asp Lys Val Pro Gly Ala Leu Cys Val  
165 170 175

Leu Gln Glu Gly Gly Glu Thr Glu Ile Val Leu Arg Val Gly Glu Ala  
180 185 190

Leu Leu Lys Glu Arg Leu Pro Lys Ser Phe Lys Gln Asp Val Val Leu  
195 200 205

Val Met Ala Leu Ala Phe Leu Asp Val Ser Arg Asp Ala Met Ala Leu  
210 215 220

Asp Pro Pro Asp Phe Ile Thr Gly Tyr Glu Phe Val Glu Glu Ala Leu  
225 230 235 240

Lys Leu Leu Gln Glu Glu Gly Ala Ser Ser Leu Ala Pro Asp Leu Arg  
245 250 255

Ala Gln Ile Asp Glu Thr Leu Glu Glu Ile Thr Pro Arg Tyr Val Leu  
260 265 270

Glu Leu Leu Gly Leu Pro Leu Gly Asp Asp Tyr Ala Ala Lys Arg Leu  
275 280 285

Asn Gly Leu Ser Gly Val Arg Asn Ile Leu Trp Ser Val Gly Gly Gly  
290 295 300

Gly Ala Ser Ala Leu Val Gly Gly Leu Thr Arg Glu Lys Phe Met Asn  
305 310 315 320

Glu Ala Phe Leu Arg Met Thr Ala Ala Glu Gln Val Asp Leu Phe Val  
325 330 335

Ala Thr Pro Ser Asn Ile Pro Ala Glu Ser Phe Glu Val Tyr Glu Val  
340 345 350

Ala Leu Ala Leu Val Ala Gln Ala Phe Ile Gly Lys Lys Pro His Leu  
355 360 365

Leu Gln Asp Ala Asp Lys Gln Phe Gln Gln Leu Gln Gln Ala Lys Val  
370 375 380

Met Ala Met Glu Ile Pro Ala Met Leu Tyr Asp Thr Arg Asn Asn Trp  
385 390 395 400

Glu Ile Asp Phe Gly Leu Glu Arg Gly Leu Cys Ala Leu Leu Ile Gly  
405 410 415

Lys Val Asp Glu Cys Arg Met Trp Leu Gly Leu Asp Ser Glu Asp Ser  
420 425 430

Gln Tyr Arg Asn Pro Ala Ile Val Glu Phe Val Leu Glu Asn Ser Asn  
435 440 445

Arg Asp Asp Asn Asp Asp Leu Pro Gly Leu Cys Lys Leu Leu Glu Thr  
450 455 460

Trp Leu Ala Gly Val Val Phe Pro Arg Phe Arg Asp Thr Lys Asp Lys  
465 470 475 480

Lys Phe Lys Leu Gly Asp Tyr Tyr Asp Asp Pro Met Val Leu Ser Tyr  
485 490 495

Leu Glu Arg Val Glu Val Val Gln Gly Ser Pro Leu Ala Ala Ala  
500 505 510

Ala Met Ala Arg Ile Gly Ala Glu His Val Lys Ala Ser Ala Met Gln  
515 520 525

Ala Leu Gln Lys Val Phe Pro Ser Arg Tyr Thr Asp Arg Asn Ser Ala  
530 535 540

Glu Pro Lys Asp Val Gln Glu Thr Val Phe Ser Val Asp Pro Val Gly  
545 550 555 560

Asn Asn Val Gly Arg Asp Gly Glu Pro Gly Val Phe Ile Ala Glu Ala  
565 570 575

Val Arg Pro Ser Glu Asn Phe Glu Thr Asn Asp Tyr Ala Ile Arg Ala  
580 585 590

Gly Val Ser Glu Ser Ser Val Asp Glu Thr Thr Val Glu Met Ser Val  
595 600 605

Ala Asp Met Leu Lys Glu Ala Ser Val Lys Ile Leu Ala Ala Gly Val  
610 615 620

Ala Ile Gly Leu Ile Ser Leu Phe Ser Gln Lys Tyr Phe Leu Lys Ser  
625 630 635 640

Ser Ser Ser Phe Gln Arg Lys Asp Met Val Ser Ser Met Glu Ser Asp  
645 650 655

Val Ala Thr Ile Gly Ser Val Arg Ala Asp Asp Ser Glu Ala Leu Pro  
660 665 670

Arg Met Asp Ala Arg Thr Ala Glu Asn Ile Val Ser Lys Trp Gln Lys  
675 680 685

Ile Lys Ser Leu Ala Phe Gly Pro Asp His Arg Ile Glu Met Leu Pro  
690 695 700

Glu Val Leu Asp Gly Arg Met Leu Lys Ile Trp Thr Asp Arg Ala Ala  
705 710 715 720

Glu Thr Ala Gln Leu Gly Leu Val Tyr Asp Tyr Thr Leu Leu Lys Leu  
725 730 735

Ser Val Asp Ser Val Thr Val Ser Ala Asp Gly Thr Arg Ala Leu Val  
740 745 750

Glu Ala Thr Leu Glu Glu Ser Ala Cys Leu Ser Asp Leu Val His Pro  
755 760 765

Glu Asn Asn Ala Thr Asp Val Arg Thr Tyr Thr Thr Arg Tyr Glu Val  
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Phe Trp Ser Lys Ser Gly Trp Lys Ile Thr Glu Gly Ser Val Leu Ala  
785 790 795 800

Ser

<210> 132  
<211> 561  
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<213> *Protochlorococcus marinus* MT9313

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Ser	Arg	Pro	Lys	Leu	Pro	Phe	Pro	Asp	Arg	Pro	Ser	Ser	Asp	Thr	Glu
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Leu	Glu	Ala	Leu	Thr	Ala	His	Gln	Pro	Thr	Ile	Asp	Ile	Ala	Glu	Lys
					100			105			110				

Asp	Leu	Leu	Gly	Gly	Leu	Leu	Leu	Leu	Asp	Leu	Gly	Glu	Tyr	Glu
					115			120			125			

Leu Val Leu Lys Trp Ala Ala Pro Tyr Leu Lys Gly Lys Gly Lys Leu  
130 135 140

Val Lys Glu Gly Lys Phe Gly Ala Val Glu Ile Val Glu Gln Glu Leu  
145 150 155 160

Arg Leu Cys Leu Ala Leu Ala His Trp Glu Leu Ser Arg Glu Gln Trp  
165 170 175

Leu Gln Gln His Tyr Glu Gln Ala Ala Leu Ser Gly Gln Lys Ser Gln  
180 185 190

Glu Leu Leu Val Asp Val Ala Gln Phe Ala Asp Leu Gln Gln Glu Ile  
195 200 205

Gln Gly Asp Leu Asn Arg Leu Arg Pro Tyr Gln Val Leu Glu Leu Leu  
210 215 220

Ala Leu Pro Glu Ser Glu Thr Gln Glu Arg Gln Arg Gly Leu Gln Leu  
225 230 235 240

Leu Gln Glu Met Leu Ser Ala Arg Val Gly Ile Asp Gly Gln Gly Asp  
245 250 255

Asp Gln Ser Gly Leu Ser Ile Asp Asp Phe Leu Arg Phe Ile Gln Gln  
260 265 270

Leu Arg Ser Tyr Leu Thr Val Gln Glu Gln Leu Asp Leu Phe Val Ala  
275 280 285

Glu Ser Lys Arg Pro Ser Ala Ala Ala Ala Tyr Leu Ala Val Tyr Ala  
290 295 300

Leu Leu Ala Ala Gly Phe Ser Gln Arg Lys Pro Asp Leu Val Val Gln  
305 310 315 320

Ala Gln Thr Leu Leu Lys Arg Leu Gly Lys Arg Gln Asp Val Phe Leu  
325 330 335

Glu Gln Ser Ile Cys Ala Leu Leu Leu Gly Gln Pro Ser Glu Ala Asn  
340 345 350

Gln Leu Leu Glu Gln Ser Gln Glu Gln Glu Ala Ile Ala Tyr Ile Gln  
355 360 365

Glu Gln Ser Glu Gly Ala Pro Asp Leu Leu Pro Gly Leu Cys Leu Tyr  
370 375 380

Gly Glu Gln Trp Leu Lys Thr Glu Val Phe Ser His Phe Arg Asp Leu  
385 390 395 400

Arg Gln Arg Leu Glu Asp Gly Ser Val Ser Leu Thr Ala Tyr Phe Ala  
405 410 415

Asp Pro Glu Val Gln Gln Tyr Leu Asp Asp Leu Leu Thr Glu Ala Val  
420 425 430

Pro Thr Pro Thr Pro His Pro Asp Thr Glu Ser Thr Ala Ala Pro Ser  
435 440 445

Glu Lys Pro Pro Glu Thr Leu Gln Ser Glu Thr Gly Val Ser Pro His  
450 455 460

Pro Ser Arg Pro Ala Lys Val Asp Ser Phe Glu Asp Leu Val Thr Gln  
465 470 475 480

Thr Pro Ala Thr Val Pro Pro Ala Pro Pro Ser Pro Gly Val Ala Pro  
485 490 495

Val Thr Ala Ala Leu Asn Pro Asp Pro Glu Ala Ser Ser Ala Ser Ser  
500 505 510

Lys Ser Val Ser Ser Lys Lys Ser Ile Gly Pro Trp Gly Ala Ile Ala  
515 520 525

Ala Ile Val Gly Ser Val Leu Leu Val Val Gly Leu Val Arg Ile Leu  
530 535 540

Ser Gly Leu Thr Thr Gln Glu Pro Leu Gln Val Thr Leu Asn Gly Glu  
545 550 555 560

Pro	Pro	Leu	Thr	Ile	Pro	Ser	Leu	Asp	Thr	Ala	Glu	Ala	Asn	Asn	Asn
565									570					575	
Pro	Glu	Asn	Gly	Ala	Thr	Asp	Thr	Thr	Thr	Thr	Pro	Ala	Leu	Asn	Glu
580							585						590		
Ala	Ile	Ala	Ala	Glu	Val	Ile	Gln	Thr	Trp	Phe	Glu	Ser	Lys	Ala	Arg
595						600							605		
Ala	Phe	Gly	Gln	Asp	Arg	Asp	Leu	Ala	Ala	Leu	Glu	Asn	Ile	Leu	Ala
610					615						620				
Glu	Pro	Ser	Leu	Ser	Arg	Trp	Arg	Ser	Ser	Ala	Gln	Ala	Val	Arg	Ser
625					630				635				640		
Ala	Gly	Thr	Tyr	Arg	Thr	Tyr	Asp	His	Ser	Leu	Thr	Ile	Glu	Thr	Val
645								650					655		
Ser	Phe	Asn	Pro	Asp	Gln	Pro	Asn	Val	Ala	Thr	Val	Glu	Ala	Gln	Val
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Gln	Glu	Lys	Ala	Asp	Tyr	Tyr	Arg	Ala	Asn	Gly	Glu	Arg	Asp	Pro	Gly
675							680					685			
Gln	Ser	Tyr	Asp	Ser	Asp	Leu	Arg	Val	Arg	Tyr	Ser	Leu	Val	Arg	Gln
690						695					700				
Gly	Asp	Arg	Trp	Leu	Ile	Arg	Ser	Ser	Gln	Thr	Leu				
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<213> Synechococcus PCC7942

<400> 162

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Ala Ser Ala Asp Lys Leu Ala Glu Ser Tyr Arg Asp Arg Leu Asn Gln  
20 25 30

Ser Pro Ser His Glu Phe Ser Glu Leu Ala Leu Gln Ala Arg Arg Gln  
35 40 45

Leu Leu Glu Ala Ala Ile Ala Glu Leu Ser Asp Pro Glu Gln Arg Asp  
50 55 60

Arg Tyr Asp Arg Arg Phe Phe Gln Gly Gly Leu Glu Ala Ile Glu Pro  
65 70 75 80

Ser Leu Glu Leu Glu Asp Trp Gln Arg Ile Gly Ala Leu Leu Ile Leu  
85 90 95

Leu Glu Leu Gly Glu Tyr Asp Arg Val Ser Gln Leu Ala Glu Glu Leu  
100 105 110

Leu Pro Asp Tyr Asp Ala Ser Ala Glu Val Arg Asp Gln Phe Ala Arg  
115 120 125

Gly Asp Ile Ala Leu Ala Ile Ala Leu Ser Gln Gln Ser Leu Gly Arg  
130 135 140

Glu Cys Arg Gln Gln Gly Leu Tyr Glu Gln Ala Ala Gln His Phe Gly  
145 150 155 160

Arg Ser Gln Ser Ala Leu Ala Asp His Gln Arg Phe Pro Glu Leu Ser  
165 170 175

Arg Thr Leu His Gln Glu Gln Gly Gln Leu Arg Pro Tyr Arg Ile Leu  
180 185 190

Glu Arg Leu Ala Gln Pro Leu Thr Ala Asp Ser Asp Arg Gln Gln Gly  
195 200 205

Leu Leu Leu Leu Gln Ala Met Leu Asp Asp Arg Gln Gly Ile Glu Gly  
210 215 220

Pro Gly Asp Asp Gly Ser Gly Leu Thr Leu Asp Asn Phe Leu Met Phe  
225 230 235 240

Leu Gln Gln Ile Arg Gly Tyr Leu Thr Leu Ala Glu Gln Gln Leu Leu  
245 250 255

Phe Glu Ser Glu Ala Arg Arg Pro Ser Pro Ala Ala Ser Phe Phe Ala  
260 265 270

Cys Tyr Thr Leu Ile Ala Arg Gly Phe Cys Asp His Gln Pro Ser Leu  
275 280 285

Ile His Arg Ala Ser Leu Leu His Glu Leu Lys Ser Arg Met Asp  
290 295 300

Val His Ile Glu Gln Ala Ile Ala Ser Leu Leu Leu Gly Gln Pro Glu  
305 310 315 320

Glu Ala Glu Ala Leu Leu Val Gln Ser Gln Asp Glu Glu Thr Leu Ser  
325 330 335

Gln Ile Arg Ala Leu Ala Gln Gly Glu Ala Leu Ile Val Gly Leu Cys  
340 345 350

Arg Phe Thr Glu Thr Trp Leu Ala Thr Lys Val Phe Pro Asp Phe Arg  
355 360 365

Asp Leu Lys Glu Arg Thr Ala Pro Leu Gln Pro Tyr Phe Asp Asp Pro  
370 375 380

Asp Val Gln Thr Tyr Leu Asp Ala Ile Val Glu Leu Pro Ser Asp Leu  
385 390 395 400

Met Pro Thr Pro Leu Pro Val Glu Pro Leu Glu Val Arg Ser Ser Leu  
405 410 415

Leu Ala Lys Glu Leu Pro Thr Pro Ala Thr Pro Gly Val Ala Pro Pro  
420 425 430

Pro Arg Arg Arg Arg Asp Arg Ser Glu Arg Pro Ala Arg Thr Ala  
435 440 445

Lys Arg Leu Pro Leu Pro Trp Ile Gly Leu Gly Val Val Val Val Leu  
450 455 460

Gly Gly Gly Thr Gly Val Trp Ala Trp Arg Ser Arg Ser Asn Ser Thr  
465 470 475 480

Pro Pro Thr Pro Pro Pro Val Val Gln Thr Leu Pro Glu Ala Val Pro  
485 490 495

Ala Pro Ser Pro Ala Pro Val Thr Val Ala Leu Asp Arg Ala Gln Ala  
500 505 510

Glu Thr Val Leu Gln Asn Trp Leu Ala Ala Lys Ala Ala Ala Leu Gly  
515 520 525

Pro Gln Tyr Asp Arg Asp Arg Leu Ala Thr Val Leu Thr Gly Glu Val  
530 535 540

Leu Gln Thr Trp Gln Gly Phe Ser Ser Gln Gln Ala Asn Thr Gln Leu  
545 550 555 560

Thr Ser Gln Phe Asp His Lys Leu Thr Val Asp Ser Val Gln Leu Ser  
565 570 575

Asp Gly Asp Gln Arg Ala Val Val Gln Ala Lys Val Asp Glu Val Glu  
580 585 590

Gln Val Tyr Arg Gly Asp Gln Leu Leu Glu Thr Arg Arg Asp Leu Gly  
595 600 605

Leu Val Ile Arg Tyr Gln Leu Val Arg Glu Asn Asn Ile Trp Lys Ile  
610 615 620

Ala Ser Ile Ser Leu Val Arg  
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<213> Anabaena PCC7120

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cctgacaaaa	atgcccagat	acaatcccc	gaggtgagtc	tcacagaaga	aacggcaagg	2040
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caatttatg	agaatggca	aaaagggaaag	tcttctgacg	aaagattacg	tgtacgctat	2340
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<211> 798

<212> PRT

<213> Anabaena PCC7120

<400> 164

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Arg	Gln	Ala	Tyr	Ser	Asp	Arg	Ile	Val	Gln	Leu	Pro	Arg	Arg	Glu	Tyr
															45

Ser	Gln	Ala	Ala	Ile	Ala	Ser	Arg	Lys	Gln	Leu	Ile	Glu	Glu	Ala	Tyr
															60

Val	Val	Leu	Ser	Asp	Pro	Lys	Glu	Arg	Ser	Ser	Tyr	Asp	Gln	Leu	Tyr
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Leu Ala His Ala Tyr Asp Pro Asp Asn Ala Ala Thr Thr Lys Val Ala															
				85					90				95		
Val	Glu	Asn	Arg	Gly	Asp	Ser	Asn	Asn	Gly	His	Phe	Asp	Val	Gln	Ser
	100					105							110		
Leu	Ser	Ile	Glu	Val	Ser	Ser	Glu	Glu	Leu	Ile	Gly	Ala	Leu	Leu	Ile
	115					120							125		
Leu	Gln	Glu	Leu	Gly	Glu	Tyr	Glu	Leu	Val	Leu	Lys	Leu	Gly	Arg	Asn
	130					135					140				
Tyr	Leu	Gly	Asn	Gln	Asn	Gly	Thr	Ala	Ser	Thr	Arg	Asn	Gly	Asn	His
	145					150				155				160	
Arg	Thr	Pro	Glu	Glu	Phe	Leu	Asp	Ser	Ser	Glu	Arg	Pro	Asp	Ile	Leu
						165			170				175		
Leu	Thr	Val	Ala	Leu	Ala	Ser	Leu	Glu	Leu	Gly	Arg	Glu	Gln	Trp	Gln
						180			185				190		
Gln	Gly	His	Tyr	Glu	Asn	Ala	Ala	Leu	Ser	Leu	Glu	Thr	Gly	Gln	Glu
	195					200							205		
Val	Leu	Phe	Ser	Glu	Gly	Ile	Phe	Pro	Ser	Val	Gln	Ala	Glu	Ile	Gln
	210					215					220				
Ala	Asp	Leu	Tyr	Lys	Leu	Arg	Pro	Tyr	Arg	Ile	Leu	Glu	Leu	Leu	Ala
	225					230				235				240	
Leu	Pro	Gln	Glu	Lys	Thr	Ile	Glu	Arg	His	Gln	Gly	Leu	Asp	Leu	Leu
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Gln	Ser	Ile	Leu	Asp	Asp	Arg	Gly	Gly	Ile	Asp	Gly	Thr	Gly	Asn	Asp
	260					265							270		
Gln	Ser	Gly	Leu	Asn	Ile	Asp	Asp	Phe	Leu	Arg	Phe	Ile	Gln	Gln	Leu
	275					280						285			

Arg His His Leu Thr Val Ala Glu Gln His Lys Leu Phe Asp Gly Glu  
290 295 300

Ser Lys Arg Pro Ser Ala Val Ala Thr Tyr Leu Ala Val Tyr Ala Ser  
305 310 315 320

Ile Ala Arg Gly Phe Thr Gln Arg Gln Pro Ala Leu Ile Arg His Ala  
325 330 335

Lys Gln Ile Leu Met Arg Leu Ser Lys Arg Gln Asp Val His Leu Glu  
340 345 350

Gln Ser Leu Cys Ala Leu Leu Gly Gln Thr Glu Glu Ala Thr Arg  
355 360 365

Val Leu Glu Leu Ser Gln Glu Tyr Glu Ala Leu Ala Leu Ile Arg Glu  
370 375 380

Lys Ser Gln Asp Ser Pro Asp Leu Leu Pro Gly Leu Cys Leu Tyr Ala  
385 390 395 400

Glu Gln Trp Leu Gln Asn Glu Val Phe Pro His Phe Arg Asp Leu Ser  
405 410 415

Arg Gln Gln Ala Ser Leu Lys Asp Tyr Phe Ala Asn Gln Gln Val Gln  
420 425 430

Ala Tyr Leu Glu Ala Leu Pro Asn Asp Ala Glu Thr Thr Asn Glu Trp  
435 440 445

Ala Val Ile Asn Arg Gln Ser Phe Ser Gln Pro Arg Gly Asn Ser Tyr  
450 455 460

Ser Gly Gly Thr Pro Val Ala Lys Arg Pro Val Gly Lys Ala Asn Arg  
465 470 475 480

Pro Gly Glu Ala Ser Thr Arg Pro Val Pro Gln Arg Ser His Pro Ser  
485 490 495

Glu Val Asn Arg Gln Phe His Gln Asn Arg Thr Pro Asp Pro Glu Leu  
500 • 505 510

Pro Glu Thr Ser Asn His Arg Arg Pro Glu Ser Ser Asn Phe Thr Thr  
515 520 525

Ala Arg Glu Asn Ile Ser Thr Thr Asp Ala Tyr Thr Asp Asn Tyr Pro  
530 535 540

Pro Glu Ile Pro Val Glu Arg Ala Ser Arg Pro Val Gln Pro Gly Val  
545 550 555 560

Ser Gly Tyr Thr Gln Ser Thr Pro Pro Arg Gln Thr Pro Lys Arg Arg  
565 570 575

Arg Arg Lys Lys Pro Gln Ala Val Val Asn Arg Gly His Ser Ile His  
580 585 590

Gln Gln Arg Gln Pro Ser Pro Ser Thr Leu Gly Arg Lys Thr Arg Leu  
595 600 605

Leu Trp Ile Val Leu Gly Ser Leu Gly Gly Ile Leu Leu Phe Trp Leu  
610 615 620

Ile Val Ser Thr Thr Phe Gly Trp Leu Lys Asn Val Phe Phe Pro Ala  
625 630 635 640

Pro Ser Leu Gln Gly Glu Gln Leu Ser Ile Gln Ile Ser Gln Pro Pro  
645 650 655

Leu Glu Ile Pro Asp Lys Asn Ala Gln Ile Gln Ser Pro Glu Val Ser  
660 665 670

Leu Thr Glu Glu Thr Ala Arg Lys Ile Ile Glu Asn Trp Leu Ala Thr  
675 680 685

Lys Ala Ser Ala Leu Gly Ala Glu His Lys Ile Glu Ser Leu Asn Glu  
690 695 700

Ile Leu Thr Gly Ser Ala Leu Ser Gln Trp Arg Leu Ile Ala Leu Gln  
705 710 715 720

Asp Lys Ala Asp Asn Arg His Arg Glu Tyr Ser His Ser Val Lys Val  
725 730 735

Asp Ser Ile Ser Lys Ser Asp Ile Asp Pro Asn Arg Ala Ser Val Gly  
740 745 750

Ala Thr Val Arg Glu Leu Thr Gln Phe Tyr Glu Asn Gly Gln Lys Gly  
755 760 765

Lys Ser Ser Asp Glu Arg Leu Arg Val Arg Tyr Glu Leu Ile Arg Gln  
770 775 780

Asp Asp Ile Trp Arg Ile Gln Arg Met Ser Ala Ala Ile Asn  
785 790 795

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<211> 798  
<212> PRT  
<213> Anabaena PCC7120

<400> 165

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Tyr Tyr Arg Ile Leu Gly Leu Pro Leu Ala Ala Ser Asp Glu Gln Leu  
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Arg Gln Ala Tyr Ser Asp Arg Ile Val Gln Leu Pro Arg Arg Glu Tyr  
35 40 45

Ser Gln Ala Ala Ile Ala Ser Arg Lys Gln Leu Ile Glu Glu Ala Tyr  
50 55 60

Val Val Leu Ser Asp Pro Lys Glu Arg Ser Ser Tyr Asp Gln Leu Tyr  
65 70 75 80

Leu Ala His Ala Tyr Asp Pro Asp Asn Ala Ala Thr Thr Lys Val Ala  
85 90 95

Val Glu Asn Arg Gly Asp Ser Asn Asn Gly His Phe Asp Val Gln Ser  
100 105 110

Leu Ser Ile Glu Val Ser Ser Glu Glu Leu Ile Gly Ala Leu Leu Ile  
115 120 125

Leu Gln Glu Leu Gly Glu Tyr Glu Leu Val Leu Lys Leu Gly Arg Asn  
130 135 140

Tyr Leu Gly Asn Gln Asn Gly Thr Ala Ser Thr Arg Asn Gly Asn His  
145 150 155 160

Arg Thr Pro Glu Glu Phe Leu Asp Ser Ser Glu Arg Pro Asp Ile Leu  
165 170 175

Leu Thr Val Ala Leu Ala Ser Leu Glu Leu Gly Arg Glu Gln Trp Gln  
180 185 190

Gln Gly His Tyr Glu Asn Ala Ala Leu Ser Leu Glu Thr Gly Gln Glu  
195 200 205

Val Leu Phe Ser Glu Gly Ile Phe Pro Ser Val Gln Ala Glu Ile Gln  
210 215 220

Ala Asp Leu Tyr Lys Leu Arg Pro Tyr Arg Ile Leu Glu Leu Leu Ala  
225 230 235 240

Leu Pro Gln Glu Lys Thr Ile Glu Arg His Gln Gly Leu Asp Leu Leu  
245 250 255

Gln Ser Ile Leu Asp Asp Arg Gly Gly Ile Asp Gly Thr Gly Asn Asp  
260 265 270

Gln Ser Gly Leu Asn Ile Asp Asp Phe Leu Arg Phe Ile Gln Gln Leu  
275 280 285

Arg His His Leu Thr Val Ala Glu Gln His Lys Leu Phe Asp Gly Glu  
290 295 300

Ser Lys Arg Pro Ser Ala Val Ala Thr Tyr Leu Ala Val Tyr Ala Ser  
305 310 315 320

Ile Ala Arg Gly Phe Thr Gln Arg Gln Pro Ala Leu Ile Arg His Ala  
325 330 335

Lys Gln Ile Leu Met Arg Leu Ser Lys Arg Gln Asp Val His Leu Glu  
340 345 350

Gln Ser Leu Cys Ala Leu Leu Gly Gln Thr Glu Glu Ala Thr Arg  
355 360 365

Val Leu Glu Leu Ser Gln Glu Tyr Glu Ala Leu Ala Leu Ile Arg Glu  
370 375 380

Lys Ser Gln Asp Ser Pro Asp Leu Leu Pro Gly Leu Cys Leu Tyr Ala  
385 390 395 400

Glu Gln Trp Leu Gln Asn Glu Val Phe Pro His Phe Arg Asp Leu Ser  
405 410 415

Arg Gln Gln Ala Ser Leu Lys Asp Tyr Phe Ala Asn Gln Gln Val Gln  
420 425 430

Ala Tyr Leu Glu Ala Leu Pro Asn Asp Ala Glu Thr Thr Asn Glu Trp  
435 440 445

Ala Val Ile Asn Arg Gln Ser Phe Ser Gln Pro Arg Gly Asn Ser Tyr  
450 455 460

Ser Gly Gly Thr Pro Val Ala Lys Arg Pro Val Gly Lys Ala Asn Arg  
465 470 475 480

Pro Gly Glu Ala Ser Thr Arg Pro Val Pro Gln Arg Ser His Pro Ser  
485 490 495

Glu Val Asn Arg Gln Phe His Gln Asn Arg Thr Pro Asp Pro Glu Leu  
500 505 510

Pro Glu Thr Ser Asn His Arg Arg Pro Glu Ser Ser Asn Phe Thr Thr  
515 520 525

Ala Arg Glu Asn Ile Ser Thr Thr Asp Ala Tyr Thr Asp Asn Tyr Pro  
530 535 540

Pro Glu Ile Pro Val Glu Arg Ala Ser Arg Pro Val Gln Pro Gly Val  
545 550 555 560

Ser Gly Tyr Thr Gln Ser Thr Pro Pro Arg Gln Thr Pro Lys Arg Arg  
565 570 575

Arg Arg Lys Lys Pro Gln Ala Val Val Asn Arg Gly His Ser Ile His  
580 585 590

Gln Gln Arg Gln Pro Ser Pro Ser Thr Leu Gly Arg Lys Thr Arg Leu  
595 600 605

Leu Trp Ile Val Leu Gly Ser Leu Gly Gly Ile Leu Leu Phe Trp Leu  
610 615 620

Ile Val Ser Thr Thr Phe Gly Trp Leu Lys Asn Val Phe Phe Pro Ala  
625 630 635 640

Pro Ser Leu Gln Gly Glu Gln Leu Ser Ile Gln Ile Ser Gln Pro Pro  
645 650 655

Leu Glu Ile Pro Asp Lys Asn Ala Gln Ile Gln Ser Pro Glu Val Ser  
660 665 670

Leu Thr Glu Glu Thr Ala Arg Lys Ile Ile Glu Asn Trp Leu Ala Thr  
675 680 685

Lys Ala Ser Ala Leu Gly Ala Glu His Lys Ile Glu Ser Leu Asn Glu  
690 695 700

Ile Leu Thr Gly Ser Ala Leu Ser Gln Trp Arg Leu Ile Ala Leu Gln  
705 710 715 720

Asp Lys Ala Asp Asn Arg His Arg Glu Tyr Ser His Ser Val Lys Val  
725 730 735

Asp Ser Ile Ser Lys Ser Asp Ile Asp Pro Asn Arg Ala Ser Val Gly  
740 745 750

Ala Thr Val Arg Glu Leu Thr Gln Phe Tyr Glu Asn Gly Gln Lys Gly  
755 760 765

Lys Ser Ser Asp Glu Arg Leu Arg Val Arg Tyr Glu Leu Ile Arg Gln  
770 775 780

Asp Asp Ile Trp Arg Ile Gln Arg Met Ser Ala Ala Ile Asn  
785 790 795

<210> 166  
<211> 2307  
<212> DNA  
<213> Nostoc punctiforme

<400> 166  
gtgcgaattc cgcttagatta ctaccgaatt ttaggactac cgtagcgcc aagtgaagaa 60  
caattgcgac aggcatacag cgatgcatt gtacaattgc cacgacgtga gtattctcag 120  
gcagcaattt cttctcgtaa acaactcata gaagaagctt acgtggtttt atcagatcca 180  
aaacaacgca gtacctacga tcagcttat cttgcccacg cctatgaccc tgataacctt 240

gctgctgccg cagtagcaca ggaaaatcg	acagaaagca cccaaagggg tagtgatacc	300
cagagtctg gtatagaaat tacccaagac	gaatttagttg gcgcatttatt aattttgcaa	360
gagttgggtg aatacgaact tgtattgaaa	ctaggtcgtc cgtacctagt aaataaaaat	420
agtgctacaa gttcaagaaa aagcaataac	ttagcagatg aagaaattta tgaaagtgc	480
gaacacccag atgtcggtct cactgttgct	cttgcctgtc tagaattagg tcgggaacag	540
tggcagcaag gtcactacga aaatgccgc	atatccctag aaactggtca agagctgcta	600
gtacgtgaag gtttggctc cagtatccag	gcagaaattc aggctgatct ttacaaattg	660
cggccatatac gaattttgga gttgctcgca	ttacctcaag aaaagactgc cgaacgaagc	720
caaggcttag aattattgca aaatctctta	gaagatcg	780
aatgatgaat cgggtttaaa catagatgac	tttctgcgtt ttatccagca gttacgcaac	840
cacttaacag ttgcagaaca gcacaagtt	tttgaagctc aaagcaaacg ttcttctgct	900
gttgcactt acttagctgt ttatgcctt	atagcgcgag gatttgctca acggcaacct	960
gcttaattc gtcaagcaag acaaatgctc	gtgcgtctgg gcaagcgcca agatgtacat	1020
ttagaacagt cgctatgtgc cttactttt	gggcaaactg aagaagcaac tcgtgtttt	1080
gaacttagtc aggagtacga agctttagct	tttattcggg aaaaatctca ggactctcca	1140
gatttggtagt cgggtctgtg tttatatgca	gaacagtggc tgcaacacga agtcttccc	1200
cattttcgag atttagcaaa ccagcaagct	ttcctaaaag attactttgc taaccaacag	1260
gtgcaagctt atttagaagc actgccaact	gatgccaaa caactaatga atgggctgta	1320
attaaccccc agtattttcc ccaggccaag	gcaaagaata ctcattttca taacaattca	1380
actaaaactt cagcgtcatt taatcacagc	agagtaccta acccagattt gccagaaaca	1440
ccaacaaaag aaacctctga atatccaaac	ttctcaccac ctatgtggag ttcatctgga	1500
agtataaaat cagaggttcc tgctgctgaa	aggatgagca gaggtactaa tcagcatttg	1560
aacggttcag ctaagagtgc tgcatctggt	cataaccaaa agcgtaggcg gagaaaacct	1620
actccatctg ctagccgaga gcgtatacca	gataatcg	1680
aggcggcgaa cttttgcgaa caccatagaa	ggtaaaacac ggctggatg gagagtgttt	1740
atttctttgg tgagcatatt agtttttgg	gtattagcca caacaacttt tggatggta	1800
aaaaatctgt ttttcctca accttctccg	cctgatctac agttgtttgt acaaataaaac	1860
caaccaccgt tacctattcc cgatccaaat	agaaaaccag aatcagaaga aggcccttta	1920
acaaatgcag aggcagaaga agttattcac	acttggttat ctaccaaagc cgtagcttta	1980

gggc当地 atgagattaa taat tagag caaattttaa ctggttcagc tttatctcaa 2040  
tggcgactga ttgctcaaca gaataagtta gacaatcgct accgcaagtt cgaccatagt 2100  
ttgaagatag aatctgttga gaaaattggt ttat tgcag atcgtgccgc agtagaagct 2160  
acggtcaaag aagtgacgca gttat atgaa aataatcagt ttaaaaactc ttctaacgat 2220  
aaattaagag ttcggtatga cttgattcga gaacgaggta aatggcgtat tcagagtaca 2280  
tctgtttaaa atcaattcac cagataa 2307

<210> 167  
<211> 768  
<212> PRT  
<213> Nostoc punctiforme

<400> 167

Val Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu Gly Leu Pro Leu Ala  
1 5 10 15

Ala Ser Glu Glu Gln Leu Arg Gln Ala Tyr Ser Asp Arg Ile Val Gln  
20 25 30

Leu Pro Arg Arg Glu Tyr Ser Gln Ala Ala Ile Ser Ser Arg Lys Gln  
35 40 45

Leu Ile Glu Glu Ala Tyr Val Val Leu Ser Asp Pro Lys Gln Arg Ser  
50 55 60

Thr Tyr Asp Gln Leu Tyr Leu Ala His Ala Tyr Asp Pro Asp Asn Leu  
65 70 75 80

Ala Ala Ala Ala Val Ala Gln Glu Asn Arg Thr Glu Ser Thr Lys Arg  
85 90 95

Gly Ser Asp Thr Gln Ser Leu Gly Ile Glu Ile Thr Gln Asp Glu Leu  
100 105 110

Val Gly Ala Leu Leu Ile Leu Gln Glu Leu Gly Glu Tyr Glu Leu Val  
115 120 125

Leu Lys Leu Gly Arg Pro Tyr Leu Val Asn Lys Asn Ser Ala Thr Ser  
130 135 140

Ser Arg Lys Ser Asn Asn Leu Ala Asp Glu Glu Ile Tyr Glu Ser Ala  
145 150 155 160

Glu His Pro Asp Val Val Leu Thr Val Ala Leu Ala Cys Leu Glu Leu  
165 170 175

Gly Arg Glu Gln Trp Gln Gln Gly His Tyr Glu Asn Ala Ala Ile Ser  
180 185 190

Leu Glu Thr Gly Gln Glu Leu Leu Val Arg Glu Gly Leu Phe Ser Ser  
195 200 205

Ile Gln Ala Glu Ile Gln Ala Asp Leu Tyr Lys Leu Arg Pro Tyr Arg  
210 215 220

Ile Leu Glu Leu Leu Ala Leu Pro Gln Glu Lys Thr Ala Glu Arg Ser  
225 230 235 240

Gln Gly Leu Glu Leu Leu Gln Asn Leu Leu Glu Asp Arg Gly Gly Ile  
245 250 255

Asp Gly Thr Asn Asn Asp Glu Ser Gly Leu Asn Ile Asp Asp Phe Leu  
260 265 270

Arg Phe Ile Gln Gln Leu Arg Asn His Leu Thr Val Ala Glu Gln His  
275 280 285

Lys Leu Phe Glu Ala Gln Ser Lys Arg Ser Ser Ala Val Ala Thr Tyr  
290 295 300

Leu Ala Val Tyr Ala Leu Ile Ala Arg Gly Phe Ala Gln Arg Gln Pro  
305 310 315 320

Ala Leu Ile Arg Gln Ala Arg Gln Met Leu Val Arg Leu Gly Lys Arg  
325 330 335

Gln Asp Val His Leu Glu Gln Ser Leu Cys Ala Leu Leu Glu Gly Gln  
340 345 350

Thr Glu Glu Ala Thr Arg Val Leu Glu Leu Ser Gln Glu Tyr Glu Ala  
355 360 365

Leu Ala Phe Ile Arg Glu Lys Ser Gln Asp Ser Pro Asp Leu Leu Pro  
370 375 380

Gly Leu Cys Leu Tyr Ala Glu Gln Trp Leu Gln His Glu Val Phe Pro  
385 390 395 400

His Phe Arg Asp Leu Ala Asn Gln Gln Ala Phe Leu Lys Asp Tyr Phe  
405 410 415

Ala Asn Gln Gln Val Gln Ala Tyr Leu Glu Ala Leu Pro Thr Asp Ala  
420 425 430

Gln Thr Thr Asn Glu Trp Ala Val Ile Asn Pro Gln Tyr Phe Pro Gln  
435 440 445

Ala Lys Ala Lys Asn Thr His Phe His Asn Asn Ser Thr Lys Thr Ser  
450 455 460

Ala Ser Phe Asn His Ser Arg Val Pro Asn Pro Asp Leu Pro Glu Thr  
465 470 475 480

Pro Thr Lys Glu Thr Ser Glu Tyr Pro Asn Phe Ser Pro Pro Met Trp  
485 490 495

Ser Ser Ser Gly Ser Ile Lys Ser Glu Val Pro Ala Ala Glu Arg Met  
500 505 510

Ser Arg Gly Thr Asn Gln His Leu Asn Gly Ser Ala Lys Ser Ala Ala  
515 520 525

Ser Gly His Asn Gln Lys Arg Arg Arg Arg Lys Pro Thr Pro Ser Ala  
530 535 540

Ser Arg Glu Arg Ile Pro Asp Asn Arg Pro His Ser Arg Arg Pro Arg  
545 550 555 560

Arg Arg Arg Thr Phe Ala Asn Thr Ile Glu Gly Lys Thr Arg Leu Val  
565 570 575

Trp Arg Val Phe Ile Ser Leu Val Ser Ile Leu Val Phe Trp Val Leu  
580 585 590

Ala Thr Thr Phe Gly Trp Leu Lys Asn Leu Phe Phe Pro Gln Pro  
 595 600 605

Ser Pro Pro Asp Leu Gln Leu Phe Val Gln Ile Asn Gln Pro Pro Leu  
 610 615 620

Pro Ile Pro Asp Pro Asn Arg Lys Pro Glu Ser Glu Glu Gly Pro Leu  
 625 630 635 640

Thr Asn Ala Glu Ala Glu Glu Val Ile His Thr Trp Leu Ser Thr Lys  
 645 650 655

Ala Ala Ala Leu Gly Pro Asn His Glu Ile Asn Asn Leu Glu Gln Ile  
 660 665 670

Leu Thr Gly Ser Ala Leu Ser Gln Trp Arg Leu Ile Ala Gln Gln Asn  
 675 680 685

Lys Leu Asp Asn Arg Tyr Arg Lys Phe Asp His Ser Leu Lys Ile Glu  
 690 695 700

Ser Val Glu Lys Ile Gly Leu Phe Ala Asp Arg Ala Ala Val Glu Ala  
 705 710 715 720

Thr Val Lys Glu Val Thr Gln Leu Tyr Glu Asn Asn Gln Phe Lys Asn  
 725 730 735

Ser Ser Asn Asp Lys Leu Arg Val Arg Tyr Asp Leu Ile Arg Glu Arg  
 740 745 750

Gly Lys Trp Arg Ile Gln Ser Thr Ser Val Val Asn Gln Phe Thr Arg  
 755 760 765

<210> 168  
 <211> 2145  
 <212> DNA  
 <213> Synechocystis PCC6803

<400> 168  
 gtgtttatcc ccctcgactt ttatcgtatt ttaggcattc ctccccagag tgggtggggaa 60  
 accattgagc aggcctacca agatcgccctt ttacaattac cccggcgaga atttagtgac 120  
 gccgcagttt ctctccgcaa tcaattactg gcgatcgccct atgaaaaccct gagggatccg 180  
 gaaaaacgtc aggcatacga ccaagaatgg tggggagcca tggatgaagc cctgggggag 240

gccttacccc tcactacccc ggagttggaa ttagccccag agcaagaaat tggagccctg	300
ttgatcctgt tggatttggg ggaatacgaa ctcgtggta agtatggtga gccagtaactc	360
cacgatccca accctccggc gggaggcctg ccccaggact atttgcttc ggtaatttg	420
gcccactggg aactgagccg ggaacgttgg caacaacagc agtatgaatt tgccgccacc	480
gccagtccta aggccttagc tcggttgcaa caggataatg acttccccgc cttggaagca	540
gaaattcgtc aggaactata cctgtcgca ccctaccgtc tcctcgaact tttggctaag	600
gaggggcaag gggaggagca acgtcagcag ggtctagtc tggcaagc gatggtgcag	660
gaccggggcg gcattgaagg taagggggaa gattattccg gattgggaaa tggacttt	720
ctaaaattca tccaccaact acgctgtcac ctcacagtgg ccgagcaaaa cgccctattt	780
ttgcccggaaa gtcaacggcc atcttagta gcaagctatt tggcagtaca tagtctgatg	840
gctgagggag tgaaggaaca ggacccatg gccattgtcg aagcaaaatc tttgattata	900
cagttggaaa attgtcaaga tttggcccta gaaaaggtaa tttgtgaatt attattgggt	960
caaacggaag ttgttctggc ggcgatcgac cagggagatc cgaaaatagt agctggcctc	1020
gaatctaagt tagcgacggg ggaagacccc ttaactgctt ttatacttt cactgagcag	1080
tggctagagg aagaaattgt cccctacttt agggatctt ctccggagac ctttcccccc	1140
aaggcctatt tcaataatcc ctccgttcag cagtagtctt aacaactaga gccggattcc	1200
ttcaccactg acaattcttt tgccctccct gccctcctta gcacccgcaac ggaatcgaa	1260
actcccatgg tacatagttc cgccgcccctt cccgatcgcc ctttgacctc caccgttccc	1320
tcacgacggg gacgcgttcc aagacgttcc cgagacgtatg tttccccag cgccgacaat	1380
tccagtggtt tggccgtcac caccctatct ccggcgatcg cctacgacac ccactccttgc	1440
ggcaccaacg gtattggcg ggatagcact agcaacggtt tttccagtaa ctccggccca	1500
gaatccacca gtaaacataa atctccccgg cgacgcaaaa aacgggtgac catcaagccg	1560
gtgcgttcg gcattttct gcttgccta gcaggcattg tggggggggc aactgcctta	1620
attatcaatc gtactggcga tcccttaggt gggttgttag aagacccctt agatgtttc	1680
ctggaccaac ctgcagaatt tatccccat gaagccacga gccggaaattt gattctcagt	1740
caacccaaact tcaatcagca agtgggtcag atggtagtac aaggctggct tggatgtaaa	1800
aagtttagcct ttggccaaaa ctacgtgtc ggggcattgc agagtgtttt agcccccata	1860
ctccctgccc aacaacgggg tcggggccaa cgggatcaag cccaaaaggt ctatcaccaa	1920
tacgaacaca agttgcagat tttagcctat caagttaacc cccaaagaccc caaccgagcc	1980

accgttactg cccggtaga agaaattagc cagccttta ccctaggtaa tcaacagcag 2040  
 aagggctccg ccaccaaaga tgacttgact gtgcgctatc agctagtacg acaccaaggg 2100  
 gtttgaaaaa ttgaccaaata acaagtggta aatggccccc gttag 2145  
  
 <210> 169  
 <211> 714  
 <212> PRT  
 <213> Synechocystis PCC6803  
  
 <400> 169  
  
 Met Phe Ile Pro Leu Asp Phe Tyr Arg Ile Leu Gly Ile Pro Pro Gln  
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 Ser Gly Gly Glu Thr Ile Glu Gln Ala Tyr Gln Asp Arg Leu Leu Gln  
 20 25 30  
  
 Leu Pro Arg Arg Glu Phe Ser Asp Ala Ala Val Thr Leu Arg Asn Gln  
 35 40 45  
  
 Leu Leu Ala Ile Ala Tyr Glu Thr Leu Arg Asp Pro Glu Lys Arg Gln  
 50 55 60  
  
 Ala Tyr Asp Gln Glu Trp Trp Gly Ala Met Asp Glu Ala Leu Gly Glu  
 65 70 75 80  
  
 Ala Leu Pro Leu Thr Thr Pro Glu Leu Glu Cys Ser Pro Glu Gln Glu  
 85 90 95  
  
 Ile Gly Ala Leu Leu Ile Leu Leu Asp Leu Gly Glu Tyr Glu Leu Val  
 100 105 110  
  
 Val Lys Tyr Gly Glu Pro Val Leu His Asp Pro Asn Pro Pro Ala Gly  
 115 120 125  
  
 Gly Leu Pro Gln Asp Tyr Leu Leu Ser Val Ile Leu Ala His Trp Glu  
 130 135 140  
  
 Leu Ser Arg Glu Arg Trp Gln Gln Gln Tyr Glu Phe Ala Ala Thr  
 145 150 155 160  
  
 Ala Ser Leu Lys Ala Leu Ala Arg Leu Gln Gln Asp Asn Asp Phe Pro  
 165 170 175

Ala Leu Glu Ala Glu Ile Arg Gln Glu Leu Tyr Arg Leu Arg Pro Tyr  
180 185 190

Arg Ile Leu Glu Leu Leu Ala Lys Glu Gly Gln Gly Glu Glu Gln Arg  
195 200 205

Gln Gln Gly Leu Ala Leu Leu Gln Ala Met Val Gln Asp Arg Gly Gly  
210 215 220

Ile Glu Gly Lys Gly Glu Asp Tyr Ser Gly Leu Gly Asn Asp Asp Phe  
225 230 235 240

Leu Lys Phe Ile His Gln Leu Arg Cys His Leu Thr Val Ala Glu Gln  
245 250 255

Asn Ala Leu Phe Leu Pro Glu Ser Gln Arg Pro Ser Leu Val Ala Ser  
260 265 270

Tyr Leu Ala Val His Ser Leu Met Ala Glu Gly Val Lys Glu Gln Asp  
275 280 285

Pro Met Ala Ile Val Glu Ala Lys Ser Leu Ile Ile Gln Leu Glu Asn  
290 295 300

Cys Gln Asp Leu Ala Leu Glu Lys Val Ile Cys Glu Leu Leu Gly  
305 310 315 320

Gln Thr Glu Val Val Leu Ala Ala Ile Asp Gln Gly Asp Pro Lys Ile  
325 330 335

Val Ala Gly Leu Glu Ser Lys Leu Ala Thr Gly Glu Asp Pro Leu Thr  
340 345 350

Ala Phe Tyr Thr Phe Thr Glu Gln Trp Leu Glu Glu Ile Val Pro  
355 360 365

Tyr Phe Arg Asp Leu Ser Pro Glu Thr Leu Ser Pro Lys Ala Tyr Phe  
370 375 380

Asn Asn Pro Ser Val Gln Gln Tyr Leu Glu Gln Leu Glu Pro Asp Ser  
385 390 395 400

Phe Thr Thr Asp Asn Ser Phe Ala Ser Pro Ala Leu Leu Ser Thr Ala  
405 410 415

Thr Glu Ser Glu Thr Pro Met Val His Ser Ser Ala Ala Leu Pro Asp  
420 425 430

Arg Pro Leu Thr Ser Thr Val Pro Ser Arg Arg Gly Arg Ser Pro Arg  
435 440 445

Arg Ser Arg Asp Asp Val Phe Pro Ser Ala Asp Asn Ser Ser Gly Leu  
450 455 460

Ala Val Thr Thr Leu Ser Pro Ala Ile Ala Tyr Asp Thr His Ser Leu  
465 470 475 480

Gly Thr Asn Gly Ile Gly Gly Asp Ser Thr Ser Asn Gly Phe Ser Ser  
485 490 495

Asn Ser Ala Pro Glu Ser Thr Ser Lys His Lys Ser Pro Arg Arg Arg  
500 505 510

Lys Lys Arg Val Thr Ile Lys Pro Val Arg Phe Gly Ile Phe Leu Leu  
515 520 525

Cys Leu Ala Gly Ile Val Gly Gly Ala Thr Ala Leu Ile Ile Asn Arg  
530 535 540

Thr Gly Asp Pro Leu Gly Gly Leu Leu Glu Asp Pro Leu Asp Val Phe  
545 550 555 560

Leu Asp Gln Pro Ser Glu Phe Ile Pro Asp Glu Ala Thr Ser Arg Asn  
565 570 575

Leu Ile Leu Ser Gln Pro Asn Phe Asn Gln Gln Val Gly Gln Met Val  
580 585 590

Val Gln Gly Trp Leu Asp Ser Lys Lys Leu Ala Phe Gly Gln Asn Tyr  
595 600 605

Asp Val Gly Ala Leu Gln Ser Val Leu Ala Pro Asn Leu Leu Ala Gln  
610 615 620

Gln Arg Gly Arg Ala Gln Arg Asp Gln Ala Gln Lys Val Tyr His Gln  
625 630 635 640

Tyr Glu His Lys Leu Gln Ile Leu Ala Tyr Gln Val Asn Pro Gln Asp  
645 650 655

Pro Asn Arg Ala Thr Val Thr Ala Arg Val Glu Glu Ile Ser Gln Pro  
660 665 670

Phe Thr Leu Gly Asn Gln Gln Lys Gly Ser Ala Thr Lys Asp Asp  
675 680 685

Leu Thr Val Arg Tyr Gln Leu Val Arg His Gln Gly Val Trp Lys Ile  
690 695 700

Asp Gln Ile Gln Val Val Asn Gly Pro Arg  
705 710

<210> 170  
<211> 714  
<212> PRT  
<213> Synechocystis PCC6803

<400> 170

Met Phe Ile Pro Leu Asp Phe Tyr Arg Ile Leu Gly Ile Pro Pro Gln  
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Ser Gly Gly Glu Thr Ile Glu Gln Ala Tyr Gln Asp Arg Leu Leu Gln  
20 25 30

Leu Pro Arg Arg Glu Phe Ser Asp Ala Ala Val Thr Leu Arg Asn Gln  
35 40 45

Leu Leu Ala Ile Ala Tyr Glu Thr Leu Arg Asp Pro Glu Lys Arg Gln  
50 55 60

Ala Tyr Asp Gln Glu Trp Trp Gly Ala Met Asp Glu Ala Leu Gly Glu  
65 70 75 80

Ala Leu Pro Leu Thr Thr Pro Glu Leu Glu Cys Ser Pro Glu Gln Glu  
85 90 95

Ile Gly Ala Leu Leu Ile Leu Leu Asp Leu Gly Glu Tyr Glu Leu Val  
100 105 110

Val Lys Tyr Gly Glu Pro Val Leu His Asp Pro Asn Pro Pro Ala Gly  
115 120 125

Gly Leu Pro Gln Asp Tyr Leu Leu Ser Val Ile Leu Ala His Trp Glu  
130 135 140

Leu Ser Arg Glu Arg Trp Gln Gln Gln Tyr Glu Phe Ala Ala Thr  
145 150 155 160

Ala Ser Leu Lys Ala Leu Ala Arg Leu Gln Gln Asp Asn Asp Phe Pro  
165 170 175

Ala Leu Glu Ala Glu Ile Arg Gln Glu Leu Tyr Arg Leu Arg Pro Tyr  
180 185 190

Arg Ile Leu Glu Leu Leu Ala Lys Glu Gly Gln Gly Glu Glu Gln Arg  
195 200 205

Gln Gln Gly Leu Ala Leu Leu Gln Ala Met Val Gln Asp Arg Gly Gly  
210 215 220

Ile Glu Gly Lys Gly Glu Asp Tyr Ser Gly Leu Gly Asn Asp Asp Phe  
225 230 235 240

Leu Lys Phe Ile His Gln Leu Arg Cys His Leu Thr Val Ala Glu Gln  
245 250 255

Asn Ala Leu Phe Leu Pro Glu Ser Gln Arg Pro Ser Leu Val Ala Ser  
260 265 270

Tyr Leu Ala Val His Ser Leu Met Ala Glu Gly Val Lys Glu Gln Asp  
275 280 285

Pro Met Ala Ile Val Glu Ala Lys Ser Leu Ile Ile Gln Leu Glu Asn  
290 295 300

Cys Gln Asp Leu Ala Leu Glu Lys Val Ile Cys Glu Leu Leu Gly  
305 310 315 320

Gln Thr Glu Val Val Leu Ala Ala Ile Asp Gln Gly Asp Pro Lys Ile  
325 330 335

Val Ala Gly Leu Glu Ser Lys Leu Ala Thr Gly Glu Asp Pro Leu Thr  
340 345 350

Ala Phe Tyr Thr Phe Thr Glu Gln Trp Leu Glu Glu Ile Val Pro  
355 360 365

Tyr Phe Arg Asp Leu Ser Pro Glu Thr Leu Ser Pro Lys Ala Tyr Phe  
370 375 380

Asn Asn Pro Ser Val Gln Gln Tyr Leu Glu Gln Leu Glu Pro Asp Ser  
385 390 395 400

Phe Thr Thr Asp Asn Ser Phe Ala Ser Pro Ala Leu Leu Ser Thr Ala  
405 410 415

Thr Glu Ser Glu Thr Pro Met Val His Ser Ser Ala Ala Leu Pro Asp  
420 425 430

Arg Pro Leu Thr Ser Thr Val Pro Ser Arg Arg Gly Arg Ser Pro Arg  
435 440 445

Arg Ser Arg Asp Asp Val Phe Pro Ser Ala Asp Asn Ser Ser Gly Leu  
450 455 460

Ala Val Thr Thr Leu Ser Pro Ala Ile Ala Tyr Asp Thr His Ser Leu  
465 470 475 480

Gly Thr Asn Gly Ile Gly Gly Asp Ser Thr Ser Asn Gly Phe Ser Ser  
485 490 495

Asn Ser Ala Pro Glu Ser Thr Ser Lys His Lys Ser Pro Arg Arg Arg  
500 505 510

Lys Lys Arg Val Thr Ile Lys Pro Val Arg Phe Gly Ile Phe Leu Leu  
515 520 525

Cys Leu Ala Gly Ile Val Gly Gly Ala Thr Ala Leu Ile Ile Asn Arg  
530 535 540

Thr Gly Asp Pro Leu Gly Gly Leu Leu Glu Asp Pro Leu Asp Val Phe  
545 550 555 560

Leu Asp Gln Pro Ser Glu Phe Ile Pro Asp Glu Ala Thr Ser Arg Asn  
565 570 575

Leu Ile Leu Ser Gln Pro Asn Phe Asn Gln Gln Val Gly Gln Met Val  
580 585 590

Val Gln Gly Trp Leu Asp Ser Lys Lys Leu Ala Phe Gly Gln Asn Tyr  
595 600 605

Asp Val Gly Ala Leu Gln Ser Val Leu Ala Pro Asn Leu Leu Ala Gln  
610 615 620

Gln Arg Gly Arg Ala Gln Arg Asp Gln Ala Gln Lys Val Tyr His Gln  
625 630 635 640

Tyr Glu His Lys Leu Gln Ile Leu Ala Tyr Gln Val Asn Pro Gln Asp  
645 650 655

Pro Asn Arg Ala Thr Val Thr Ala Arg Val Glu Glu Ile Ser Gln Pro  
660 665 670

Phe Thr Leu Gly Asn Gln Gln Lys Gly Ser Ala Thr Lys Asp Asp  
675 680 685

Leu Thr Val Arg Tyr Gln Leu Val Arg His Gln Gly Val Trp Lys Ile  
690 695 700

Asp Gln Ile Gln Val Val Asn Gly Pro Arg  
705 710

<210> 171  
<211> 819  
<212> PRT  
<213> *Arabidopsis thaliana*

<400> 171

Met Pro Val Ala Tyr Thr Phe Pro Val Leu Pro Ser Ser Cys Leu Leu  
1 5 10 15

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Arg Leu Asn Ala Ala Gly Gly Gly Ile His Val Val Asp Asn Ala Pro  
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Ser Arg Thr Ser Ser Leu Ala Ala Ser Thr Ser Thr Ile Glu Leu Pro  
85 90 95

Val Thr Cys Tyr Gln Leu Ile Gly Val Ser Glu Gln Ala Glu Lys Asp  
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Glu Val Val Lys Ser Val Ile Asn Leu Lys Lys Thr Asp Ala Glu Glu  
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Val Arg Asp Lys Leu Leu Phe Glu Ser Glu Tyr Ala Gly Asn Leu Lys  
145 150 155 160

Glu Lys Ile Ala Pro Lys Ser Pro Leu Arg Ile Pro Trp Ala Trp Leu  
165 170 175

Pro Gly Ala Leu Cys Leu Leu Gln Glu Val Gly Gln Glu Lys Leu Val  
180 185 190

Leu Asp Ile Gly Arg Ala Ala Leu Arg Asn Leu Asp Ser Lys Pro Tyr  
195 200 205

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210 215 220

Lys Ala Ala Phe Glu Val Asn Lys Val Ser Gln Gly Phe Glu Ala Leu  
225 230 235 240

Ala Arg Ala Gln Ser Phe Leu Lys Ser Lys Val Thr Leu Gly Lys Leu  
245 250 255

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Cys Thr Leu Asp Leu Leu Gly Leu Pro Arg Thr Pro Glu Asn Ala Glu  
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Arg Arg Arg Gly Ala Ile Ala Ala Leu Arg Glu Leu Leu Arg Gln Gly  
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Ala Thr Ser Leu Ser His Ser Ala Ser Glu Leu His Lys Arg Pro Met  
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Asp Thr Glu Glu Ala Glu Glu Leu Val Arg Gln Trp Glu Asn Val Lys  
690 695 700

Ala Glu Ala Leu Gly Pro Thr His Gln Val Tyr Ser Leu Ser Glu Val  
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Leu Asp Glu Ser Met Leu Val Gln Trp Gln Thr Leu Ala Gln Thr Ala  
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Glu Ala Lys Ser Cys Tyr Trp Arg Phe Val Leu Leu His Leu Glu Val  
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755 760 765

Ile Glu Ala Leu Leu Glu Glu Ala Ala Glu Leu Val Asp Glu Ser Gln  
770 775 780 785

Pro Lys Asn Ala Lys Tyr Tyr Ser Thr Tyr Lys Ile Arg Tyr Ile Leu  
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 Val Thr Cys Tyr Gln Leu Ile Gly Val Ser Glu Gln Ala Glu Lys Asp  
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 Glu Val Val Lys Ser Val Ile Asn Leu Lys Lys Thr Asp Ala Glu Glu  
 115 120 125  
  
 Gly Tyr Thr Met Glu Ala Ala Ala Arg Gln Asp Leu Leu Met Asp  
 130 135 140  
  
 Val Arg Asp Lys Leu Leu Phe Glu Ser Glu Tyr Ala Gly Asn Leu Lys  
 145 150 155 160  
  
 Glu Lys Ile Ala Pro Lys Ser Pro Leu Arg Ile Pro Trp Ala Trp Leu  
 165 170 175

Pro Gly Ala Leu Cys Leu Leu Gln Glu Val Gly Gln Glu Lys Leu Val  
180 185 190

Leu Asp Ile Gly Arg Ala Ala Leu Arg Asn Leu Asp Ser Lys Pro Tyr  
195 200 205

Ile His Asp Ile Phe Leu Ser Met Ala Leu Ala Glu Cys Ala Ile Ala  
210 215 220

Lys Ala Ala Phe Glu Val Asn Lys Val Ser Gln Gly Phe Glu Ala Leu  
225 230 235 240

Ala Arg Ala Gln Ser Phe Leu Lys Ser Lys Val Thr Leu Gly Lys Leu  
245 250 255

Ala Leu Leu Thr Gln Ile Glu Glu Ser Leu Glu Gly Leu Ala Pro Pro  
260 265 270

Cys Thr Leu Asp Leu Leu Gly Leu Pro Arg Thr Pro Glu Asn Ala Glu  
275 280 285

Arg Arg Arg Gly Ala Ile Ala Ala Leu Arg Glu Leu Leu Arg Gln Gly  
290 295 300

Leu Ser Val Glu Ala Ser Cys Gln Ile Gln Asp Trp Pro Cys Phe Leu  
305 310 315 320

Ser Gln Ala Ile Ser Arg Leu Leu Ala Thr Glu Ile Val Asp Leu Leu  
325 330 335

Pro Trp Asp Asp Leu Ala Ile Thr Arg Lys Asn Lys Lys Ser Leu Glu  
340 345 350

Ser His Asn Gln Arg Val Val Ile Asp Phe Asn Cys Phe Tyr Met Val  
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Leu Leu Gly His Ile Ala Val Gly Phe Ser Gly Lys Gln Asn Glu Thr  
370 375 380

Ile Asn Lys Ala Lys Thr Ile Cys Glu Cys Leu Ile Ala Ser Glu Gly  
385 390 395 400

Val Asp Leu Lys Phe Glu Glu Ala Phe Cys Ser Phe Leu Leu Lys Gln  
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Gly Ser Glu Ala Glu Ala Leu Glu Lys Leu Lys Gln Leu Glu Ser Asn  
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435 440 445

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Phe Arg Ala Glu Lys Lys Tyr Pro Glu Asn Lys Lys Met Gly Ser Pro  
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Pro Thr Asp Leu Gln Ser Pro Val Val Ser Ala Lys Asn Asn Asp Glu  
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Thr Ser Ala Ser Met Pro Ser Val Gln Leu Lys Arg Asn Leu Gly Val  
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His Lys Asn Lys Ile Trp Asp Glu Trp Leu Ser Gln Ser Ser Leu Ile  
565 570 575

Gly Arg Val Ser Val Val Ala Leu Leu Gly Cys Thr Val Phe Phe Ser  
580 585 590

Leu Lys Leu Ser Gly Ile Arg Ser Gly Arg Leu Gln Ser Met Pro Ile  
595 600 605

Ser Val Ser Ala Arg Pro His Ser Glu Ser Asp Ser Phe Leu Trp Lys  
610 615 620

Thr Glu Ser Gly Asn Phe Arg Lys Asn Leu Asp Ser Val Asn Arg Asn  
625 630 635 640

Gly Ile Val Gly Asn Ile Lys Val Leu Ile Asp Met Leu Lys Met His  
645 650 655

Cys Gly Glu His Pro Asp Ala Leu Tyr Leu Lys Ser Ser Gly Gln Ser  
660 665 670

Ala Thr Ser Leu Ser His Ser Ala Ser Glu Leu His Lys Arg Pro Met  
675 680 685

Asp Thr Glu Glu Ala Glu Glu Leu Val Arg Gln Trp Glu Asn Val Lys  
690 695 700

Ala Glu Ala Leu Gly Pro Thr His Gln Val Tyr Ser Leu Ser Glu Val  
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Leu Asp Glu Ser Met Leu Val Gln Trp Gln Thr Leu Ala Gln Thr Ala  
725 730 735

Glu Ala Lys Ser Cys Tyr Trp Arg Phe Val Leu Leu His Leu Glu Val  
740 745 750

Leu Gln Ala His Ile Phe Glu Asp Gly Ile Ala Gly Glu Ala Ala Glu  
755 760 765

Ile Glu Ala Leu Leu Glu Ala Ala Glu Leu Val Asp Glu Ser Gln  
770 775 780

Pro Lys Asn Ala Lys Tyr Tyr Ser Thr Tyr Tyr Lys Ile Arg Tyr Ile Leu  
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<210> 175
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<212> DNA
<213> Gossypium arboreum

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<212>  DNA
<213>  Hordeum vulgare

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accgacccca ggaacgatga tttgtacgac actaagtaca ccacccggta cgagatggcc      360
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Asp Pro Asp Leu Arg Arg Ser Tyr Asp Ala Lys Leu Ala Ala Gly His  
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Thr Ala Leu Arg Val Ser Gln Gln Asp Leu Pro Gly Ala Leu Val Val  
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Leu Gln Glu Ile Gly Glu His Gln Leu Val Leu Asp Leu Gly Leu Arg  
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Trp Leu Glu Val Asn Gly Gly Gln Pro Asp Ala Gly Asp Val Ala Ala  
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Gln Leu Gln Pro Pro Pro Ala Ser Ala Leu Pro Gly Pro Asp Gly Ala  
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180 185 190

Leu Gln Gln Gln Ile Val Gly Ala Leu Arg Asp Leu Ala Pro Glu Tyr  
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Ala Cys Glu Leu Ala Ala Leu Pro Leu Gly Ala Glu Thr Ala Ala Arg  
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Arg Ala Lys Gly Val Ala Leu Met Arg Gly Val Leu Arg Ala Ala Ala  
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Thr Val Ala Ala Ala Thr Ala Lys Pro Glu Ala Ala Ala Asp Asp Ser  
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Val His Ser Thr Ala Met Ala Glu His Ala Ala Arg Ser Ala Ala Gly  
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Gly Gly Gln Glu Gly Gly Val Pro Arg Arg Met Ser Glu Ala Asp Leu  
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755 760 765

Pro Pro Pro Pro Pro Ser Arg Ala Gln Lys Ala Leu Thr Tyr Ala Ala  
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gagcagcgcg atgcctacga tcgccactgc cgtaccgttg atcccgatga tttgattgcc 240

cagttggatc ccgatgccac cactccccac attgaaatta gtgatgagca attgtcgaaa	300
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tttcttaaaa aggatgttt tgagcgaaat cgccccata cttccccctgc cgccgttgcc	420
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cagtcctatg aatcagccgc ctctcagcta gaagccggtc tccaggtact tcagcggta	540
aatttgtttc ccgagctcca ggagcagttt cagacggaac tgaatcggct gcgtccctac	600
cgcattctgg aattactggc actgccttg tccgatagtg cgaatcggca gcggggatt	660
ttattgctgc ggcaaattgtt gaggagcgc gggggcattt agggggcgcgg tgacgatcgc	720
tcaggactaa cagttgagga ttttctgaaa ttttatttgc aactgcgcag ccattttacc	780
gtggcagaac aacaggaact ctttgaacgg gaatcgccgc gtccctcagc ggtggccacc	840
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ccggggcttt attactacac cacacaatgg ctcacggagg aaatttatcc tgcatttcgg	1140
gacttggggg aaacacccgt ggccttggag gcttactttt ctgatgccaa tgtccaaacc	1200
tatctagagg ctctcagtga ggactccatt gcccctgaac cccctgcgcac cactgcctct	1260
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gttcttgtgg gtttaggggc gttggcaaaa gtctattggc cggccaaaac cgctgaagcc	1560
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ccgacgaccc tagccatcac tttaacacca gagatggcgc gcgatgcct ccacacttgg	1680
cagcaaatta aagcccaagc cttgggcga ccatttggagg tggacaaact aacaacgatt	1740
ttggcggagc cagaactcag ccgctggcga tcgcgggcac agggcttaaaa gtccgagggc	1800
agctattggg tttataccct aaagaactta gaagtgaagg aagtccgcct ccaaaggagc	1860

gatcggtgtgg	aggtgttggc	agaagtcaac	gaggatgccc	gtttctatga	acagggaaacc	1920
ctgcgcactg	atatttccta	tagcgatccc	taccgggtca	tttatacctt	tatccgtcgc	1980
ggcaatcaat	ggttgattca	aggcatgcag	gtggtagtt	aa		2022

<210>	192
<211>	673
<212>	PRT
<213>	Thermosynechococcus elongatus
<400>	192

Met	Arg	Ile	Pro	Leu	Asp	Tyr	Tyr	Gln	Val	Leu	Gly	Val	Pro	Ile	Gln
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Ala	Thr	Pro	Glu	Gln	Ile	Glu	Gln	Ala	Phe	Arg	Asp	Arg	Leu	Leu	Gln
					20			25					30		

Leu	Pro	Thr	His	Gln	His	Ser	Pro	Thr	Thr	Val	Ala	Thr	Arg	Arg	Glu
							35		40			45			

Leu	Ile	Glu	Gln	Ala	Tyr	Ala	Val	Leu	Arg	Glu	Pro	Glu	Gln	Arg	Asp
							50		55			60			

Ala	Tyr	Asp	Arg	His	Cys	Arg	Thr	Val	Asp	Pro	Asp	Asp	Leu	Ile	Ala
							65		70		75		80		

Gln	Leu	Asp	Pro	Asp	Ala	Thr	Thr	Pro	His	Ile	Glu	Ile	Ser	Asp	Glu
							85		90			95			

Gln	Leu	Ser	Gly	Ala	Leu	Leu	Leu	Tyr	Glu	Leu	Gly	Asn	Tyr	Ala
							100		105			110		

Gln	Val	Val	Asn	Leu	Gly	Asp	Ala	Phe	Leu	Lys	Lys	Asp	Val	Phe	Glu
							115		120			125			

Arg	Asn	Arg	Pro	Tyr	Thr	Ser	Pro	Ala	Ala	Val	Ala	Asp	Ile	Thr	Leu
							130		135			140			

Thr	Val	Ala	Leu	Ala	Tyr	Leu	Glu	Leu	Gly	Arg	Glu	Glu	Trp	Gln	Arg
							145		150		155		160		

Gln	Ser	Tyr	Glu	Ser	Ala	Ala	Ser	Gln	Leu	Glu	Ala	Gly	Leu	Gln	Val
								165		170			175		

Leu Gln Arg Val Asn Leu Phe Pro Glu Leu Gln Glu Gln Phe Gln Thr  
180 185 190

Glu Leu Asn Arg Leu Arg Pro Tyr Arg Ile Leu Glu Leu Leu Ala Leu  
195 200 205

Pro Leu Ser Asp Ser Ala Asn Arg Gln Arg Gly Ile Leu Leu Leu Arg  
210 215 220

Gln Met Leu Ser Glu Arg Gly Gly Ile Glu Gly Arg Gly Asp Asp Arg  
225 230 235 240

Ser Gly Leu Thr Val Glu Asp Phe Leu Lys Phe Ile Leu Gln Leu Arg  
245 250 255

Ser His Leu Thr Val Ala Glu Gln Gln Glu Leu Phe Glu Arg Glu Ser  
260 265 270

Arg Arg Pro Ser Ala Val Ala Thr Tyr Leu Ala Val His Ala Leu Val  
275 280 285

Ala Arg Gly Val His Glu Leu Gln Pro Ser Tyr Ile Cys Arg Ala Lys  
290 295 300

Asp Leu Leu Gln Gln Leu Leu Pro His Gln Asp Val Tyr Leu Glu Leu  
305 310 315 320

Ala Ser Cys Leu Leu Leu Gly Gln Pro Thr Glu Ala Leu Ala Ala  
325 330 335

Leu Asp His Ser Gln Asp Gln Pro Thr Leu Asp Phe Ile Arg Arg His  
340 345 350

Ala Gly Glu Ala Gly Asp Arg Leu Pro Gly Leu Tyr Tyr Tyr Thr Thr  
355 360 365

Gln Trp Leu Thr Glu Glu Ile Tyr Pro Ala Phe Arg Asp Leu Gly Glu  
370 375 380

Thr Pro Val Ala Leu Glu Ala Tyr Phe Ala Asp Ala Asn Val Gln Thr  
385 390 395 400

Tyr Leu Glu Ala Leu Ser Glu Asp Ser Ile Ala Pro Glu Pro Pro Ala  
405 410 415

Thr Thr Ala Ser Ala Leu Pro Glu Val Ile Arg Pro Thr Val Ala Val  
420 425 430

Pro Pro Pro Leu Ser Phe Thr Ala Glu Thr Leu Pro Leu Gln Asp Gln  
435 440 445

Ser Arg Leu Gly Gln Gly Leu Ser Ala Ser Ala Phe Thr Pro Ser Ala  
450 455 460

Thr Ala Thr Gly Thr Ser Met Pro Gln Pro Ser Pro Arg Lys Arg Arg  
465 470 475 480

Ser Pro Arg Asn Arg Cys Ala Gln Lys Arg Gln Thr Trp Phe Trp Met  
485 490 495

Gly Ala Gly Val Val Leu Val Gly Leu Gly Ala Leu Ala Lys Val Tyr  
500 505 510

Trp Pro Ala Lys Thr Ala Glu Ala Pro Pro Pro Pro Val Thr Pro Ala  
515 520 525

Pro Thr Pro Val Ala Thr Pro Thr Pro Thr Pro Gln Pro Thr Thr Leu  
530 535 540

Ala Ile Thr Leu Thr Pro Glu Met Ala Arg Asp Arg Leu His Thr Trp  
545 550 555 560

Gln Gln Ile Lys Ala Gln Ala Leu Gly Arg Pro Phe Glu Val Asp Lys  
565 570 575

Leu Thr Thr Ile Leu Ala Glu Pro Glu Leu Ser Arg Trp Arg Ser Arg  
580 585 590

Ala Gln Gly Leu Lys Ser Glu Gly Ser Tyr Trp Val Tyr Thr Leu Lys  
595 600 605

Asn Leu Glu Val Lys Glu Val Arg Leu Gln Arg Ser Asp Arg Val Glu  
610 615 620

Val Leu Ala Glu Val Asn Glu Asp Ala Arg Phe Tyr Glu Gln Gly Thr  
625 630 635 640

Leu Arg Thr Asp Ile Ser Tyr Ser Asp Pro Tyr Arg Val Ile Tyr Thr  
645 650 655

Phe Ile Arg Arg Gly Asn Gln Trp Leu Ile Gln Gly Met Gln Val Val  
660 665 670

Ser

<210> 193  
<211> 2370  
<212> DNA  
<213> Trichodesmium erythraeum

<400> 193  
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cagttgcggc aggcacatca agaccgcact cagcagttc ctagaaggga gtattctgaa 120  
gccacaatag ttgctcgtaa acagcttata gatgaggc ttgctgttct ttgcgatcct 180  
gaacaacgtaa aacccatgtt tggttaacttt ttagctaaaa cctacgagcc aatagtagaa 240  
gaactcaatc caagttctca gataaatttt gatcaagcac aagaaaaaga aaccacactt 300  
aaggagacta gagaagttct tccggaaata gcttctaaac agttaaaaaaa aaggacaagt 360  
tatcaaaaca gagagactaa agctgcctct gatttcatt ctaataccccc tagtata 420  
atagaatatc cacaatttgt gggagccatc ctaattttac atgagctagg agaatatgag 480  
ctagtattaa aaataactca cccttatctt cttacaataa gtataactat taaagatgga 540  
cgttttggag acccagcatt agtttgcca gatgttgtcc ttacagttgc tctagcaa 600  
ttagaattgg gcagagagga atggcaacaa ggacaatacg aaagtgcagc tacagctta 660  
gaggctggcc tagggttatt gctacgagaa aacctatttgc tccaaatacg aggagagata 720  
caagctgacc tttataagct acgtccttat agaataatgg agctaatacg actaccagag 780  
gaaatagctc tagaccgtac ccgtggacta gaaattcttc aagatatgct caatgaacgg 840  
ggaggaatttgc atggtcaagg tgaagatagc tctggacttg ggatagaaga ttttctaaag 900  
tttggcagc agctacgtca atacttaact acagcagagc aaaagaagtt atttgaggca 960  
gaagcccttc gcccttccgc agttggtgca tatctagcgg tttatacttt tttagctcaa 1020  
gggtttgctc aaaaacaacc agccttatt cgtaaagcta agttgatgtt aatgcaatttgc 1080  
ggtcggagtc aagatgtaaa ttttagagaaa tctgtctgtc cttaactttt agggcaaact 1140  
gaagaagcta gtcgttcatt agaacttagc catgaaaatg aacctctatc cttaattttaa 1200

gaaaattctc aacaatctcc agatttattg ccaggtctat	gtctctatgc tgaacattgg	1260
ttgacagagg aggttttcc acatttccgt gatttgcctg acaagtcagc	ttcttgaaa	1320
gattatttg cagatcaaca tggcaagct tatctagaag ctttacctac	agaagcagag	1380
gtagctaatac aatgggttagt cggtcagcct cggtcgtagta atcacaataa	aaaacaaatg	1440
ttcgacccca aggaacttga gaagttgaat gtatcagatt tggaggataa	agatatttct	1500
cggtagatg ctactgctac tggattgtt gcttctggaa gtcaaggaag ttctaattta		1560
ctaggggcta gttctgtatgg gttgcttcaa gaattagaaa aatcatcatc tactagaggt		1620
gggcacaaac aagtaactac taagagttct agtcactatt tagaaaaat tagggaaaag		1680
agtataagtg gtttacctga gtttaatgaa agtacatcta ttgagagtgg ggggttaccc		1740
caatctatcc aagagcatag ttacgtaga acttctgcta gaagagaacc tgttaagttt		1800
ggtcgtttaa tattaatcgc aattgtggta tttttgttaa taggatttat tgggttgtta		1860
acaattaaaa ctatcggttg gttagtaaat gctttaggat gggaaagaga aaaactgatg		1920
atacaattgg ataggcctcc tatagaaatc ccagaacctg atcgggttaa cctcgcagca		1980
tcaggaccga taacaaaaga agtagcaagg cgaacaattc aaagttgggt agatatcaag		2040
gcttctgctc ttggccttaa tcataaaattt gaacaattac caaatatttt agtagaaccg		2100
gcactttctc gttggttacc tacagctaatt gcccgtgaagc aagaaaagtc ataccgtagg		2160
tatgagcatg atttagaaat aagtaatata aagatgagta atacaatttc taatctcgct		2220
caagtagatg ctaaagtgtat agaaaaggta gagtttattt ctgacaatgg tagattaact		2280
aatactaaca atgaaaactt atttggcgt tatgatttag ttctgtaaaag tcaaaaatgg		2340
caaatttagta attggaaggt attgagataa		2370

<210> 194

<211> 789

<212> PRT

<213> Trichodesmium erythraeum

<400> 194

Val	Arg	Ile	Pro	Leu	Asp	Tyr	Tyr	Arg	Ile	Leu	Gly	Leu	Pro	Ile	Gln
1				5					10				15		

Ala	Thr	Ala	Glu	Gln	Leu	Arg	Gln	Ala	His	Gln	Asp	Arg	Thr	Gln	Gln
			20				25						30		

Phe	Pro	Arg	Arg	Glu	Tyr	Ser	Glu	Ala	Thr	Ile	Val	Ala	Arg	Lys	Gln
			35				40					45			

Leu Ile Asp Glu Ala Tyr Ala Val Leu Cys Asp Pro Glu Gln Arg Gln  
50 55 60

Thr Tyr Asp Gly Asn Phe Leu Ala Lys Thr Tyr Glu Pro Ile Val Glu  
65 70 75 80

Glu Leu Asn Pro Ser Ser Gln Ile Asn Phe Asp Gln Ala Gln Glu Lys  
85 90 95

Glu Thr Thr Leu Lys Glu Thr Arg Glu Val Leu Pro Glu Ile Ala Ser  
100 105 110

Lys Gln Leu Lys Lys Arg Thr Ser Tyr Gln Asn Arg Glu Thr Lys Ala  
115 120 125

Ala Ser Asp Phe His Ser Asn Thr Pro Ser Ile Glu Ile Glu Tyr Pro  
130 135 140

Gln Phe Val Gly Ala Ile Leu Ile Leu His Glu Leu Gly Glu Tyr Glu  
145 150 155 160

Leu Val Leu Lys Ile Thr His Pro Tyr Leu Leu Asn Asn Ser Ile Thr  
165 170 175

Ile Lys Asp Gly Arg Phe Gly Asp Pro Ala Leu Val Leu Pro Asp Val  
180 185 190

Val Leu Thr Val Ala Leu Ala Asn Leu Glu Leu Gly Arg Glu Glu Trp  
195 200 205

Gln Gln Gly Gln Tyr Glu Ser Ala Ala Thr Ala Leu Glu Ala Gly Leu  
210 215 220

Gly Leu Leu Leu Arg Glu Asn Leu Phe Val Gln Ile Arg Gly Glu Ile  
225 230 235 240

Gln Ala Asp Leu Tyr Lys Leu Arg Pro Tyr Arg Ile Met Glu Leu Ile  
245 250 255

Ala Leu Pro Glu Glu Ile Ala Leu Asp Arg Ser Arg Gly Leu Glu Ile  
260 265 270

Leu Gln Asp Met Leu Asn Glu Arg Gly Gly Ile Asp Gly Gln Gly Glu  
275 280 285

Asp Ser Ser Gly Leu Gly Ile Glu Asp Phe Leu Lys Phe Val Gln Gln  
290 295 300

Leu Arg Gln Tyr Leu Thr Thr Ala Glu Gln Lys Lys Leu Phe Glu Ala  
305 310 315 320

Glu Ala Leu Arg Pro Ser Ala Val Gly Ala Tyr Leu Ala Val Tyr Thr  
325 330 335

Phe Leu Ala Gln Gly Phe Ala Gln Lys Gln Pro Ala Phe Ile Arg Lys  
340 345 350

Ala Lys Leu Met Leu Met Gln Leu Gly Arg Ser Gln Asp Val Asn Leu  
355 360 365

Glu Lys Ser Val Cys Ala Leu Leu Leu Gly Gln Thr Glu Glu Ala Ser  
370 375 380

Arg Ser Leu Glu Leu Ser His Glu Asn Glu Pro Leu Ser Phe Ile Lys  
385 390 395 400

Glu Asn Ser Gln Gln Ser Pro Asp Leu Leu Pro Gly Leu Cys Leu Tyr  
405 410 415

Ala Glu His Trp Leu Thr Glu Glu Val Phe Pro His Phe Arg Asp Leu  
420 425 430

Ser Asp Lys Ser Ala Ser Leu Lys Asp Tyr Phe Ala Asp Gln His Val  
435 440 445

Gln Ala Tyr Leu Glu Ala Leu Pro Thr Glu Ala Glu Val Ala Asn Gln  
450 455 460

Trp Val Val Val Gln Pro Arg Arg Ser Asn His Asn Lys Lys Gln Met  
465 470 475 480

Phe Asp Pro Lys Glu Leu Glu Lys Leu Asn Val Ser Asp Leu Glu Asp  
485 490 495

Lys Asp Ile Ser Arg Val Asp Ala Thr Ala Thr Gly Ile Val Ala Ser  
500 505 510

Gly Ser Gln Gly Ser Ser Asn Leu Leu Gly Ala Ser Ser Asp Gly Leu  
515 520 525

Leu Gln Glu Leu Glu Lys Ser Ser Ser Thr Arg Gly Gly Pro Lys Gln  
530 535 540

Val Thr Thr Lys Ser Ser Ser His Tyr Leu Gly Lys Ile Arg Glu Lys  
545 550 555 560

Ser Ile Ser Gly Leu Pro Glu Phe Asn Glu Ser Thr Ser Ile Glu Ser  
565 570 575

Gly Gly Leu Pro Gln Ser Ile Gln Glu His Ser Ser Arg Arg Thr Ser  
580 585 590

Ala Arg Arg Glu Pro Val Lys Phe Gly Arg Leu Ile Leu Ile Ala Ile  
595 600 605

Val Gly Phe Leu Leu Ile Gly Phe Ile Gly Leu Leu Thr Ile Lys Thr  
610 615 620

Ile Gly Trp Leu Val Asn Ala Leu Gly Trp Glu Arg Glu Lys Leu Met  
625 630 635 640

Ile Gln Leu Asp Arg Pro Pro Ile Glu Ile Pro Glu Pro Asp Arg Val  
645 650 655

Asn Leu Ala Ala Ser Gly Pro Ile Thr Lys Glu Val Ala Arg Arg Thr  
660 665 670

Ile Gln Ser Trp Leu Asp Ile Lys Ala Ser Ala Leu Gly Pro Asn His  
675 680 685

Lys Ile Glu Gln Leu Pro Asn Ile Leu Val Glu Pro Ala Leu Ser Arg  
690 695 700

Trp Leu Pro Thr Ala Asn Ala Leu Lys Gln Glu Lys Ser Tyr Arg Arg  
705 710 715 720

Tyr Glu His Asp Leu Glu Ile Ser Asn Ile Lys Met Ser Asn Thr Asn  
725 730 735

Ser Asn Leu Ala Gln Val Asp Ala Lys Val Ile Glu Lys Val Glu Phe  
740 745 750

Tyr Ser Asp Asn Gly Arg Leu Thr Asn Thr Asn Asn Glu Asn Leu Phe  
755 760 765

Val Arg Tyr Asp Leu Val Arg Lys Ser Gln Lys Trp Gln Ile Ser Asn  
770 775 780

Trp Lys Val Leu Arg  
785

<210> 195  
<211> 765  
<212> PRT  
<213> Homo sapiens

<400> 195

Met Gly Asn Arg Gly Met Glu Asp Leu Ile Pro Leu Val Asn Arg Leu  
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Gln Asp Ala Phe Ser Ala Ile Gly Gln Asn Ala Asp Leu Asp Leu Pro  
20 25 30

Gln Ile Ala Val Val Gly Gly Gln Ser Ala Gly Lys Ser Ser Val Leu  
35 40 45

Glu Asn Phe Val Gly Arg Val Thr Arg Arg Pro Leu Val Leu Gln Leu  
50 55 60

Val Asn Ala Thr Thr Glu Tyr Ala Glu Phe Leu His Cys Lys Gly Lys  
65 70 75 80

Lys Phe Thr Glu Ala Glu Thr Asp Arg Val Thr Gly Thr Asn Lys Gly  
85 90 95

Ile Ser Pro Val Pro Ile Asn Leu Arg Val Tyr Ser Pro His Val Leu  
100 105 110

Asn Leu Thr Leu Val Asp Leu Pro Gly Met Thr Lys Val Pro Val Gly  
115 120 125

Asp Gln Pro Pro Asp Ile Glu Phe Gln Ile Arg Asp Met Leu Met Gln  
130 135 140

Phe Val Thr Lys Glu Asn Cys Ser Asp Leu Ala Asn Ser Asp Ala Leu  
145 150 155 160

Lys Val Ala Lys Glu Val Asp Pro Gln Gly Gln Arg Thr Ile Gly Val  
165 170 175

Ile Thr Lys Leu Asp Leu Met Asp Glu Gly Thr Asp Ala Arg Asp Val  
180 185 190

Leu Glu Asn Lys Leu Leu Pro Leu Arg Arg Gly Tyr Ile Gly Val Val  
195 200 205

Asn Arg Ser Gln Lys Asp Ile Asp Gly Lys Lys Asp Ile Thr Phe Leu  
210 215 220

Ser His Pro Ser Tyr Arg His Leu Ala Asp Arg Met Gly Thr Pro Tyr  
225 230 235 240

Leu Gln Lys Val Leu Asn Gln Gln Leu Thr Asn His Ile Arg Asp Thr  
245 250 255

Leu Pro Gly Leu Arg Asn Lys Leu Gln Ser Gln Leu Leu Ser Ile Glu  
260 265 270

Lys Glu Val Glu Glu Tyr Lys Asn Phe Arg Pro Asp Asp Pro Ala Arg  
275 280 285

Lys Thr Lys Ala Leu Asp Phe Glu Lys Arg Ile Glu Gly Ser Gly Asp  
290 295 300

Gln Ile Asp Thr Tyr Glu Leu Ser Gly Gly Ala Arg Ile Asn Arg Ile  
305 310 315 320

Phe His Glu Arg Phe Pro Phe Glu Leu Val Lys Met Glu Phe Asp Glu  
325 330 335

Lys Glu Leu Arg Arg Glu Ile Ser Tyr Ala Ile Lys Asn Ile His Gly  
340 345 350

Ile Arg Thr Gly Leu Phe Thr Pro Asp Met Ala Lys Lys Ile Arg Glu  
355 360 365

Pro Cys Leu Lys Cys Val Asp Met Val Ile Ser Glu Leu Ile Ser Thr  
370 375 380

Val Arg Gln Cys Thr Lys Lys Leu Gln Gln Tyr Pro Arg Leu Arg Glu  
385 390 395 400

Glu Met Glu Arg Ile Val Thr Thr His Ile Arg Glu Arg Glu Gly Arg  
405 410 415

Thr Lys Glu Gln Val Met Met Asn Thr Asn His Glu Asp Phe Ile Gly  
420 425 430

Phe Ala Asn Ala Gln Gln Arg Ser Asn Gln Met Asn Lys Lys Lys Thr  
435 440 445

Ser Gly Asn Gln Asp Glu Ile Leu Val Ile Arg Lys Gly Trp Leu Thr  
450 455 460

Ile Asn Asn Ile Gly Ile Met Lys Gly Gly Ser Lys Glu Tyr Trp Phe  
465 470 475 480

Val Leu Thr Ala Glu Asn Leu Ser Trp Tyr Lys Asp Asp Ser Val Asp  
485 490 495

Asn Leu Lys Leu Arg Asp Val Glu Lys Gly Phe Met Ser Ser Lys His  
500 505 510

Ile Phe Ala Leu Phe Asn Thr Glu Gln Arg Asn Val Tyr Lys Asp Tyr  
515 520 525

Arg Gln Leu Glu Leu Ala Cys Glu Thr Gln Glu Glu Val Asp Ser Trp  
530 535 540

Lys Ala Ser Phe Leu Arg Ala Gly Val Tyr Pro Glu Arg Val Gly Asp  
545 550 555 560

Lys Glu Lys Asp Ser Phe Met His Ser Met Asp Pro Gln Leu Glu Arg  
565 570 575

Gln Val Glu Thr Ile Arg Asn Leu Val Asp Ser Tyr Met Ala Ile Val  
580 585 590

Asn Lys Thr Val Arg Asp Leu Met Pro Lys Thr Ile Met His Leu Met  
595 600 605

Ile Asn Asn Thr Lys Glu Phe Ile Phe Ser Glu Leu Leu Ala Asn Leu  
610 615 620

Tyr Ser Cys Gly Asp Gln Asn Thr Leu Met Arg Asp Glu Met Leu Arg  
625 630 635 640

Met Tyr His Ala Leu Lys Glu Ala Leu Ser Ile Ile Gly Asn Ile Asn  
645 650 655

Thr Thr Thr Val Ser Thr Pro Met Pro Pro Pro Val Asp Asp Ser Trp  
660 665 670

Leu Gln Val Gln Ser Val Pro Ala Gly Arg Arg Ser Pro Thr Ser Ser  
675 680 685

Pro Thr Pro Gln Arg Arg Ala Pro Ala Val Pro Pro Ala Arg Pro Gly  
690 695 700

Ser Ala Gly Ser Ala Leu Gly Gly Ala Pro Pro Val Pro Ser Arg Pro  
705 710 715 720

Gly Ala Ser Pro Asp Pro Phe Gly Pro Pro Pro Gln Val Pro Ser Arg  
725 730 735

Pro Asn Arg Ala Pro Pro Gly Val Pro Ser Arg Ser Gly Gln Ala Ser  
740 745 750

Pro Ser Arg Pro Glu Ser Pro Arg Pro Pro Phe Asp Leu  
755 760 765

<210> 196  
<211> 670  
<212> PRT  
<213> *Saccharomyces cerevisiae*

<400> 196

Met Ala Ser Leu Glu Asp Leu Ile Pro Thr Val Asn Lys Leu Gln Asp  
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Val Met Tyr Asp Ser Gly Ile Asp Thr Leu Asp Leu Pro Ile Leu Ala  
20 25 30

Val Val Gly Ser Gln Ser Ser Gly Lys Ser Ser Ile Leu Glu Thr Leu  
35 40 45

Val Gly Arg Val Thr Arg Arg Pro Leu Val Leu Gln Leu Asn Asn Ile  
50 55 60

Ser Pro Asn Ser Pro Leu Ile Glu Glu Asp Asp Asn Ser Val Asn Pro  
65 70 75 80

His Asp Glu Val Thr Lys Ile Ser Gly Phe Glu Ala Gly Thr Lys Pro  
85 90 95

Leu Glu Tyr Arg Gly Lys Glu Arg Asn His Ala Asp Glu Trp Gly Glu  
100 105 110

Phe Leu His Ile Pro Gly Lys Arg Phe Tyr Glu Asn Glu Thr Ala Arg  
115 120 125

Ile Ala Gly Lys Asp Lys Gly Ile Ser Lys Ile Pro Ile Asn Leu Lys  
130 135 140

Val Phe Ser Pro His Val Leu Asn Leu Thr Leu Val Asp Leu Pro Gly  
145 150 155 160

Ile Thr Lys Val Pro Ile Gly Glu Gln Pro Pro Asp Ile Glu Lys Gln  
165 170 175

Ile Lys Asn Leu Ile Leu Asp Tyr Ile Ala Thr Pro Asn Cys Val Asp  
180 185 190

Leu Val Asn Ser Glu Ser Leu Lys Leu Ala Arg Glu Val Asp Pro Gln  
195 200 205

Gly Lys Arg Thr Ile Gly Val Ile Thr Lys Leu Asp Leu Met Asp Ser  
210 215 220

Gly Thr Asn Ala Leu Asp Ile Leu Ser Gly Lys Met Tyr Pro Leu Lys  
225 230 235 240

Leu Gly Phe Val Gly Val Val Asn Arg Ser Gln Gln Asp Ile Gln Leu  
245 250 255

Asn Lys Thr Val Glu Phe Arg Lys His Pro Val Tyr Arg Thr Ile Ser  
260 265 270

Thr Lys Cys Gly Thr Arg Tyr Leu Ala Lys Leu Leu Asn Gln Thr Leu  
275 280 285

Leu Ser His Ile Arg Asp Lys Leu Pro Asp Ile Lys Thr Lys Leu Asn  
290 295 300

Thr Leu Ile Ser Gln Thr Glu Gln Glu Leu Ala Arg Tyr Gly Gly Val  
305 310 315 320

Gly Ala Thr Thr Asn Glu Ser Arg Ala Ser Leu Val Asn Phe Ile Ser  
325 330 335

Ser Ile Asp Gly Thr Ser Ser Asp Ile Asn Thr Lys Glu Leu Cys Gly  
340 345 350

Gly Ala Arg Ile Tyr Tyr Ile Tyr Asn Asn Val Phe Gly Asn Ser Leu  
355 360 365

Lys Ser Ile Asp Pro Thr Ser Asn Leu Ser Val Leu Asp Val Arg Thr  
370 375 380

Ala Ile Arg Asn Ser Thr Gly Pro Arg Pro Thr Leu Phe Val Pro Glu  
385 390 395 400

Leu Ala Lys Leu Leu Glu Pro Ser Gln Arg Cys Val Glu Leu Val  
405 410 415

Tyr Glu Glu Leu Met Lys Ile Cys His Lys Cys Gly Ser Ala Glu Leu  
420 425 430

Ala Arg Tyr Pro Lys Leu Lys Ser Met Leu Ile Glu Val Ile Ser Glu  
435 440 445

Leu Leu Arg Glu Arg Leu Gln Pro Thr Arg Ser Tyr Val Glu Ile Asn  
450 455 460

Thr Asn His Pro Asn Phe Leu Ser Ala Thr Glu Ala Met Asp Asp Ile  
465 470 475 480

Met Lys Thr Arg Arg Lys Arg Asn Gln Glu Leu Leu Lys Ser Lys Leu  
485 490 495

Ser Gln Gln Glu Asn Gly Gln Thr Asn Gly Ile Asn Gly Thr Ser Ser  
500 505 510

Ile Ser Ser Asn Ile Asp Gln Asp Asp Gly Ile Asp Ala Glu Ser Lys  
515 520 525

Gln Thr Lys Asp Lys Phe Leu Asn Tyr Phe Gly Lys Asp Lys Lys  
530 535 540

Gly Gln Pro Val Phe Asp Ala Ser Asp Lys Lys Arg Ser Ile Ala Gly  
545 550 555 560

Asp Gly Asn Ile Glu Asp Phe Arg Asn Leu Gln Ile Ser Asp Phe Ser  
565 570 575

Leu Gly Asp Ile Asp Asp Pro Leu Thr Glu Arg Glu Glu Leu Glu Cys  
580 585 590

Glu Leu Ile Lys Arg Leu Ile Val Ser Tyr Phe Asp Ile Ile Arg Glu  
595 600 605

Met Ile Glu Asp Gln Val Pro Lys Ala Val Met Cys Leu Leu Val Asn  
610 615 620

Tyr Cys Lys Asp Ser Val Gln Asn Arg Leu Val Thr Lys Leu Tyr Lys  
625 630 635 640

Glu Thr Leu Phe Glu Glu Leu Leu Arg Glu Leu Cys Val Lys Ser Leu  
645 650 655

Gly Val Tyr Lys Lys Ala Ala Thr Leu Ile Ser Asn Ile Leu  
660 665 670

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<212> PRT  
<213> *Arabidopsis thaliana*

<400> 197

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Glu Asp Asp Ala Ala Ile Glu Glu Arg Trp Ser Leu Tyr Glu Ala Tyr  
20 25 30

Asn Glu Leu His Ala Leu Ala Gln Glu Leu Glu Thr Pro Phe Glu Ala  
35 40 45

Pro Ala Val Leu Val Val Gly Gln Gln Thr Asp Gly Lys Ser Ala Leu  
50 55 60

Val Glu Ala Leu Met Gly Phe Lys Thr Arg Arg Pro Ile Thr Leu His  
65 70 75 80

Met Lys Tyr Asp Pro Gln Cys Gln Phe Pro Leu Cys His Leu Gly Ser  
85 90 95

Asp Asp Asp Pro Ser Val Ser Leu Pro Lys Glu Ala Glu Asn Met Arg  
100 105 110

Leu Glu Gln Glu Pro Cys Ser Pro Phe Ser Ala Lys Glu Ile Ile Val  
115 120 125

Lys Val Gln Tyr Lys Tyr Cys Pro Asn Leu Thr Ile Ile Asp Thr Pro  
130 135 140

Gly Leu Ile Ala Pro Ala Pro Gly Leu Lys Asn Arg Ala Leu Gln Val  
145 150 155 160

Gln Ala Arg Ala Val Glu Ala Leu Val Arg Ala Lys Met Gln His Lys  
165 170 175

Glu Ser Asp Trp Ser Ile Ala Thr Thr Arg Arg Ile Val Met Gln Val  
180 185 190

Asp Pro Glu Leu Ser Arg Thr Ile Val Val Ser Thr Lys Leu Asp Thr  
195 200 205

Lys Ile Pro Gln Phe Ser Cys Ser Ser Asp Val Glu Val Phe Leu Ser  
210 215 220

Pro Pro Ala Ser Ala Leu Asp Ser Ser Leu Leu Gly Asp Ser Pro Phe  
225 230 235 240

Phe Tyr Gly Gln Asp Ser Val Tyr Lys Ser Asn Asp Glu Phe Lys Gln  
245 250 255

Ala Val Ser Leu Arg Glu Met Glu Asp Ile Ala Ser Leu Glu Lys Lys  
260 265 270

Leu Gly Arg Leu Leu Thr Lys Gln Glu Lys Ser Arg Ile Gly Ile Ser  
275 280 285

Lys Leu Arg Leu Phe Leu Glu Glu Leu Leu Trp Lys Arg Tyr Lys Glu  
290 295 300

Ser Val Pro Leu Ile Ile Pro Leu Arg Lys Leu Asp Thr Val Ser Lys  
305 310 315 320

Glu Leu Ser Ser Leu Asp Glu Ala Lys Leu Lys Glu Arg Gly Arg Thr  
325 330 335

Phe His Asp Leu Phe Leu Thr Lys Leu Ser Leu Leu Lys Gly Thr  
340 345 350

Val Val Ala Pro Pro Asp Lys Phe Gly Glu Thr Leu Gln Asp Glu Arg  
355 360 365

Thr Gln Gly Gly Ala Phe Val Gly Thr Asp Gly Leu Gln Phe Ser Arg  
370 375 380

Leu Tyr Gly Gly Ala Gln Tyr His Arg Ala Met Ala Glu Phe Arg Phe  
385 390 395 400

Leu Val Gly Ala Ile Lys Cys Pro Pro Ile Thr Arg Glu Glu Ile Val  
405 410 415

Asn Ala Cys Gly Val Glu Asp Ile His Asp Gly Thr Asn Tyr Ser Arg  
420 425 430

Thr Ala Cys Val Ile Ala Val Ala Lys Ala Arg Glu Thr Phe Glu Pro  
435 440 445

Phe Leu His Gln Leu Gly Leu Leu Pro Ile Ser Val Tyr Leu Leu Gln  
450 455 460

Lys Glu Gly Glu Tyr Leu Ser Gly His Glu Val Phe Leu Lys Arg Val  
465 470 475 480

Ala Ser Ala Phe Asn Ser Phe Val Glu Ser Thr Glu Lys Ser Cys Arg  
485 490 495

Asp Lys Cys Met Glu Asp Leu Ala Ser Thr Thr Arg Tyr Val Thr Trp  
500 505 510

Ser Leu His Asn Lys Asn Ser Phe Gly Gly Thr Glu His Asn Thr Thr  
515 520 525

Ser Gly Asn Ala Ile Gly Phe Ser Leu Pro Gln Asp Ala Leu Gly Gly  
530 535 540

Thr Thr Asp Thr Lys Ser Arg Ser Asp Val Lys Leu Ser His Leu Ala  
545 550 555 560

Ser Asn Ile Asp Ser Gly Ser Ser Ile Gln Thr Thr Glu Met Arg Leu  
565 570 575

Ala Asp Leu Leu Asp Ser Thr Leu Trp Asn Arg Lys Leu Ile Val Tyr  
580 585 590

Ala Leu Val Gln Gln Ile Phe Gln Gly Ile Arg Glu Tyr Phe Leu Ala  
595 600 605

Ser Ala Glu Leu Lys Phe Asn Cys Phe Leu Leu Met Pro Ile Val Asp  
610 615 620

Lys Leu Pro Ala Leu Leu Arg Glu Glu Leu Glu Asn Ala Phe Glu Asp  
625 630 635 640

Asp Leu Asp Ser Ile Phe Asp Ile Thr Asn Leu Arg Thr Glu Ile Glu  
645 650 655

Leu Arg Arg Val Lys Arg Ile Lys Glu Lys Phe Arg Val Met Asn Glu  
660 665 670

Lys Leu Asn Ser His Glu Phe Ala Gln Asn Leu Lys Ala Pro Ser Val  
675 680 685

Gln His  
690

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<210> 198
<211> 712
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<223> n is a, c, g, or t

<220>
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<223> n is a, c, g, or t

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aagggaccag gtgacataac gggtggtgct tattagatct tccatgcatt tttcatggca      120
tgatcttcg gtggatttcag caaagttata gaaagcagat gaaacacgtc tcaagaaaac      180
ttcatggcca ctttaggaatt cgccttctt ctgaagaaga taaacggaga tgggaagtaa      240
tctcttgaga atgtgaagaa gtcgactgcc caactgatga agaaaaggaa caaaagtatc      300
acgagctttt gcaacagcga tgacacatgc agtcctggag taatttgttc catcatgaat      360
atcttcgacc ccacatgcat tcacaatttc ttcacgtgta attgcagggc attttatccc      420
tccaacaaca aacctaaatt cagccatggc acgatgatat tgtgcacctc catatagacg      480
catacctgca ttaggtatta gtttgtgtgg gaactgagag ccatcaatac cgattaatgc      540
ccctccatta accctctcat cttgtagtgt ttccccaaat ttatctggag gtgcaacaac      600
tgtccctntt catagcagtg ataacttggt aaggaaaaga tcatgaaaag atctcnctt      660
ctcccttagt ttgacttcat ctaaagtgct gagttcttga tttatgtcat tt      712

<210> 199
<211> 666
<212> DNA
<213> Medicago truncatula

<220>
<221> misc_feature
<222> (646)..(646)
<223> n is a, c, g, or t

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atctaaagta acaaccacca caaaacacaa caatggagga agaaaagagaa caccaccaac      60
tcaaagacaa agaagaaaac gagtggcgac tctacgaagc ttacaatgaa cttcacgcgc      120

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ttgctcaaga acttcacacg ccttcgacg cgccggcggt actggttgtg ggccaccaaa	180
cagacggaa gaggcctta gttgaggctc taatgggctt ccagttcaac cacgtcggtg	240
gtggcaccaa aacccgcccgg cccattactc ttcacatgaa atatggccca cattgcgagt	300
ctccttcttg ctatcttctt tctgatgatg acccttctct ttctcaccat atgtcacttt	360
cccaaatcca gggttatatt gaagctgaga atgcgagggtt ggagcgtgac tcatgttgc	420
aattttcagc taaggaaata atcataaaag tggaatacaa atactgtccc aatctcacca	480
taatagacac accaggatta gttgctcctg caccaggtcg taaaaatagg gcgatacagg	540
cacaggcacg agcggtagag tcactcggtc gtgcaaaaat gcagcacaag gagttcatta	600
tactctgtct tgaagattgt agtgattgga gcaatgcgac tacgangcgc gttgtaatgc	660
aaatttg	666

<210> 200  
 <211> 663  
 <212> DNA  
 <213> *Medicago truncatula*

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gaatcaagtg ccctccaatt acccgggaag aaattgtaaa tgcttgcgaa gttgaagaca	120
ttcatgatgg aacaaactac tctaggactg cttgtgtaat tgctgttgc aaggctcatg	180
atacatttga acctttctt catcagttgg ggtctagatt gttgcacata cttaagagat	240
tgctcccaat ctcttttat cttcttcaga aagattgtga gtatctaagt ggcacatcagg	300
tgttcctcag gcgtgttgc tccgcctcg acaactttgc agaatccact gaaaatcat	360
gccgtgaaaa atgtatggag gacttggtaa gcaccacacg atatgtctca tggctctac	420
acaataagag tcgggcagga ttacgcccagt tcttagattc atttgggtgga acagaacatt	480
ccaatgtttg taatgatccc actgcaactg ttctatcaca aacaaatgtg caagagaagg	540
aagacacaaa gccacaacta gaagtaaagc tcagtcacgt ggcctctgga actgatccta	600
gcacatccac ccagacagct gaaacaaagc ttgctgaccc tcttgcatagt acactttgga	660
atc	663

<210> 201	
<211> 622	
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tgagttccgc tttgtagttg gaggaataaa atgcctcca attacaaggg aagaaattgt	120
aaatgcgtgt ggagttgaag attacatga tggcacaac tactcaagga cagcttgtgt	180
aatagccgtt gcaaaggccc gtgatacatt tgagcccttc ctcatcagt tagttgttag	240
actcttgcac attctaaaga gattacttcc tatatcagtc tatcttcttc agaaagatgg	300
tgagttatcta agtggccatg aggtgttct taggcgtgtt gcttctgctt tcaatgactt	360
tgcagaatct accgaaaggg catgtcgtga aaaatgcgtg gaggattna taagcaccac	420
ccgctatgtc acctggccc ttcacaacaa gaatcgagct gggttacgtc aatttttaga	480
ctcggtcgct ggaacagaac ataacactat gggtagtaat tgcttacctg ctggatttcc	540
ccaagattca tccttgggt ctgttgccaa tgagaaggat actaagtcaa gggcagatgt	600
gaagctcanc catgtggcgt ct	622
<210> 202	
<211> 752	
<212> DNA	
<213> <i>Solanum tuberosum</i>	
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ctgcttctgt ttctcatgtc tgctgatcga ccattaactg aaagtgaggt tagtttctg	120
cgttacactc agcagtggag taagaaggc atttttgtgc tgaacaagtc tgacatatac	180
aagaataacg gcgagttgga ggaggccatt gcatttatca aagaaaatac acggaaattg	240
ctgaatacag aatccgtAAC actgttatcca gtatctgcac ggctcgctct tgaatcaaag	300
ctttctactt ttgatggtgc ccttagtcaa aacaatggga gttcaaataa tgattctcac	360
tggaaaacca agagcttcta tgagcttgag aagtacttgt cttagttttt ggattcatcc	420
acaagtactg gaatttgagag aatgaagctg aagcttgaaa ctccaattgc cattgcagaa	480



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<211> 521
<212> DNA
<213> Populus balsamifera subsp. trichocarpa

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ttctcgaact gaatcagttt ttctaccttt gtagccagg attgtgcaga caccatatgc
tgcattaaat gcgtctaatt ctgaaggtgc tgatttctt atatatgttc atggcccaga 120
ggatgatcct gatgttagaaa tgagccctgg attcgggaat gtgaagatac caatcttgc 180
cctcaatgtc tcacgtgggg aggacacatt gtcgggtgggg gcatcaaaat ttctgaaaac 240
cggtgctagt ggttagttc tgtcatttggga agatttgagg ttatttagcg atgatgcctt 300
gagtcagatg tttgacactc tgagtgcac cggtaaaaac tttcaggatg accttgaaag 360
cttcagtaag ctcaaattcta tggatatggaa aatgatatt catgaaaaaa caacgggtggc 420
aggctttgtt aaactggagg atagagaaaa acagctcata g 480
521

<210> 206
<211> 324
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<213> Arabidopsis thaliana

<400> 206

Met Glu Ala Leu Ser His Val Gly Ile Gly Leu Ser Pro Phe Gln Leu
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Cys Arg Leu Pro Pro Ala Thr Thr Lys Leu Arg Arg Ser His Asn Thr
20 25 30

Ser Thr Thr Ile Cys Ser Ala Ser Lys Trp Ala Asp Arg Leu Leu Ser
35 40 45

Asp Phe Asn Phe Thr Ser Asp Ser Ser Ser Ser Phe Ala Thr Ala
50 55 60

Thr Thr Thr Ala Thr Leu Val Ser Leu Pro Pro Ser Ile Asp Arg Pro
65 70 75 80

Glu Arg His Val Pro Ile Pro Ile Asp Phe Tyr Gln Val Leu Gly Ala
85 90 95

Gln Thr His Phe Leu Thr Asp Gly Ile Arg Arg Ala Phe Glu Ala Arg
100 105 110

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Val Ser Lys Pro Pro Gln Phe Gly Phe Ser Asp Asp Ala Leu Ile Ser  
115 120 125

Arg Arg Gln Ile Leu Gln Ala Ala Cys Glu Thr Leu Ser Asn Pro Arg  
130 135 140

Ser Arg Arg Glu Tyr Asn Glu Gly Leu Leu Asp Asp Glu Glu Ala Thr  
145 150 155 160

Val Ile Thr Asp Val Pro Trp Asp Lys Val Pro Gly Ala Leu Cys Val  
165 170 175

Leu Gln Glu Gly Gly Glu Thr Glu Ile Val Leu Arg Val Gly Glu Ala  
180 185 190

Leu Leu Lys Glu Arg Leu Pro Lys Ser Phe Lys Gln Asp Val Val Leu  
195 200 205

Val Met Ala Leu Ala Phe Leu Asp Val Ser Arg Asp Ala Met Ala Leu  
210 215 220

Asp Pro Pro Asp Phe Ile Thr Gly Tyr Glu Phe Val Glu Glu Ala Leu  
225 230 235 240

Lys Leu Leu Gln Glu Glu Gly Ala Ser Ser Leu Ala Pro Asp Leu Arg  
245 250 255

Ala Gln Ile Asp Glu Thr Leu Glu Glu Ile Thr Pro Arg Tyr Val Leu  
260 265 270

Glu Leu Leu Gly Leu Pro Leu Gly Asp Asp Tyr Ala Ala Lys Arg Leu  
275 280 285

Asn Gly Leu Ser Gly Val Arg Asn Ile Leu Trp Ser Val Gly Gly  
290 295 300

Gly Ala Ser Ala Leu Val Gly Gly Leu Thr Arg Glu Lys Phe Met Asn  
305 310 315 320

Glu Ala Phe Leu

<210> 207  
<211> 8  
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<222> (5)..(5)  
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Cys Xaa Xaa Cys Xaa Gly Xaa Gly  
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<210> 208  
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1 5

21